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NUTRITION COMPONENT

EVALUATION STUDIES

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HYDERABAD-500 007

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PREFACE

It is very well recognised that due to phenomenal increase in the population, the gains made in the field of agriculture, industry and health as a result of technical innovation in many developing countries have not made a significant impact. India is one of the first few countries which adopted planned parenthood as a national policy and mounted a nation wide family planning programme. During the past few years, a variety of approaches based on incentive-disincentive strategies have been tried to improve the performance of the family welfare programme. However, rural population still do not seem to accept whole-heartedly to the concept of small family norm. One of the reasons for such a situation could be the high mortality of children, particularly under the age of 5 years – which account for nearly 40 per cent of total deaths in the country. Malnutrition is believed to be one of the important contributory factors for such a high childhood mortality.

Carefully planned and systematically organised health and nutrition programmes, when delivered as an integral part of family planning inputs, can be expected to result in wider acceptance of family planning services by bringing down childhood mortality. India Population Project was one such field experiment designed primarily to test not oniy the validity of the above assumption, but also to test the feasibility of organising supplementary feeding programme for vulnerable segments of the population, as part of general health services at peripheral levels.

The National Institute of Nutrition was closely associated with the nutrition component of the Project since its inception in Karnataka State. In fulfilment of its obligations, the Institute conducted a series of evaluation studies on the nutrition component of the project at different points of time, the results of which are compiled and documented in the present report.

It is hoped that the information provided here will be of practical use to such of those persons/agencies who are concerned with planning, implementation and evaluation of integrated health, nutrition and family welfare programmes.

I take this opportunity to thank the project authorities for their wholehearted cooperation in conducting these studies and providing financial support to bring out this report. I thank Dr. K. Vijayaraghavan and Dr. N. Pralhad Rao who have compiled this report.

Hyderabad-500 007
9-3-1981

Dr. P. G. Tulpule
Director.

CHAPTER 1

INDIA POPULATION PROJECT

It is very well known that because of unprecedented growth of population, there has not been any perceptible impact of the various developmental activities on the quality of life of common man in the country. It is also realised that widespread malnutrition is one of the most important public health problems of the country today. While the ill effects of large families on the nutritional status of family have been recognised, it is believed that large families are actually motivated by high child wastage. Malnutrition is believed to be one of the leading causes of illness and death among young children in the third world countries. In the recent past, the interrelationship between food, family size and disease is increasingly being recognised. Thus, increasing emphasis is being laid on integrated programmes of health embodying family planning and nutrition as two most important components of the programme.

Since the target groups are same to a large extent, in both the services, the results of such an integration could be expected to benefit the families considerably. Keeping this in mind the India Population Project was initiated by the Government of Karnataka in collaboration with the World Bank and Swedish International Development Agency to test the hypothesis whether improved child survival as a result of a comprehensive health care programme would favourably influence family planning programme.

The objectives of the Project were[1] :

1. To complete the health infrastructure, training facilities and equipment to implement the Government of India pattern for family planning services.

2. To provide additional inputs in some areas to supplement and test alternatives to this pattern, in particular, by linking the provisions of family planning services to a supplementary nutrition programme, concentrating on recently delivered mothers, greater use of mobile teams for motivation and service, and greater concentration on training, retraining and supervision.

3. To design management information and evaluation system for speedy implementation of the programme.

4. To provide the necessary technical assistance for the whole project and finance to implement experimental aspect of the above.

In Karnataka, Bangalore division was selected under the project, comprising Districts of Bangalore, Tumkur, Shimoga, Kolar and Chitradurga, covering a total population of 9.2 millions according 1971 census. The project envisaged :

1. Urban programme (Bangalore urban)

2. Government of India's optimal programme (Tumkur, Shimoga and Bangalore rural).

3. Intensive rural programme (Kolar and Chitradurga where one ANM was provided for every 5,000 population. i.e., just double the Government of India pattern). Chitradurga was having additional programme of nutrition for expectant mothers and their infants.

The Project had four wings, i.e.,

1. Population Centre : responsible for developing the overall design of the project, postulating and testing the appropriate changes in the programme inputs, developing management information and evaluation system (MIES) etc.

2. Implementation ... responsible for the implementation and progress of the programme.

3. Nutrition ... responsible for the progress of nutrition programme, and

4. Engineering ... responsible for progress of the construction of various types of buildings as laid down in the project.

Each of these four major wings of the project was headed by seperate officials who were experts in their profession. These heads were responsible for the progress of the respective divisions and enjoyed all the administrative powers as the head of the unit, provided by the Government of Karnataka.

The project had two components : (1) Nutrition component and (2) Family Planning component.

The family planning component was concerned mainly with the provision of intensive family planning services to all eligible population in the area of operation, i.e. in the districts of Bangalore, Chitradurga, Kolar, Shimoga and Tumkur.

NUTRITION COMPONENT :

The two main objectives of the component with particular reference to family planning were :

(1) To test the assumption that distribution of food supplements to mothers and children through health and family planning centres will benefit family planning efforts as a result of increased contacts with eligible mothers, and

(2) to determine whether a reduction in infant and pre-school child mortality that is likely to be achieved through improved nutritional and general health status can have a favourable influence on the desire of mothers to limit family size.

Feeding programme :

Under the programme, as a part of nutrition component, the Government of Karnataka initiated a large scale supplementary feeding programme during the month of August 1974 on a pilot basis in one of the rural development blocks of Chitradurga district. The programme envisaged distribution of food supplements on weekly 'take-home' basis to all women during the last trimester of pregnancy, nursing mothers during the first six months of lactation and children between 6 and 24 months of age in the villages of Thalak Primary Health Centre (PHC) in Chitradurga district. An extensive net-work of 26 distribution centres had been established by providing 15 additional centres and equal number of auxiliary workers in the PHC area, so that one distribution centre catered to a population of between 4000 and 5000 (4-6 villages). A mobile van distributed supplements in remote villages. The nutrition programme was later extended to the neighbouring PHC of Parasurampura.

Food supplement and mode of distribution :

The food supplement (referred to as 'Energy food') consisted of wheat (60 g), roasted Bengal-gram (10 g), groundnut flour (10 g) and jaggery (30 g) in a powdered form to which was added a premix of vitamin mineral mixture. The nutritive value of engery food is presented in Table 1.

TABLE-1

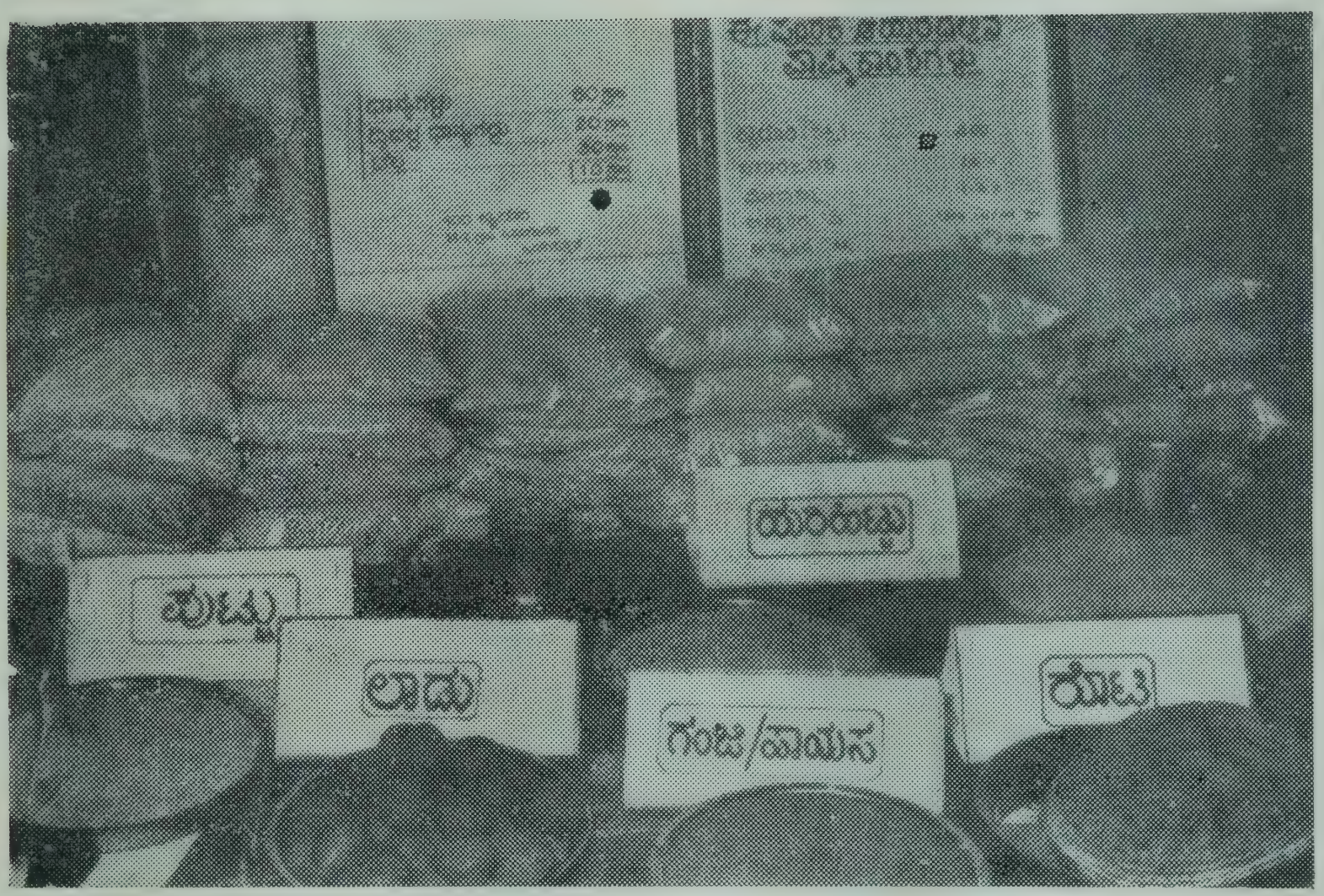
Composition of Supplement

FOODS	
Wheat	60 g.
Bengal gram	10 g.
Groundnut flour	10 g.
Jaggery	30 g.
Vitamin mineral mixture	+
NUTRIENTS PER 100 g. OF SUPPLEMENT	
Protein (g)	14*
Calories	400*
Vitamin A (μg)	400
Iron (mg)	15.0
Calcium (mg.)	400
Folic acid (mg.)	0.3

* for 110 g. of supplement

The composition of the supplement was based on the results of several diet surveys carried out in the country. It is now very well established that the primary bottleneck in the dietaries of Indian communities is energy and not protein, as was believed and the dietary deficit can be made up by consuming a little more of the same type of food that is routinely consumed by the communities[2].

At each distribution centre, an Auxiliary Nurse Midwife (ANM) assisted by another ANM (nutrition) distributed the supplements, packed in polythene bags in quantities of 385 g. on a fixed day of the week. A child beneficiary received one packet while the adult received two packets per week - which supplied 110 g. a day for mothers and 55 g. a day for children. All the children with overt signs of protein-energy malnutrition (PEM) were given two packets (110 g) of the supplement till they recovered completely. Under the programme, each beneficiary was provided with a 'Health Card' which contained relevant identification particulars of the beneficiary like name, age, physiological status, particulars of immunization, attendance etc. This card, in addition, served as a token for receiving the food. An aluminium cup which measured an amount of 55 g. of the powder when filled completely had also been supplied to each beneficiary to enable them to consume the proper amount each day.



Recipes prepared with Energy Food

Queueing up for "Energy Food"

Distribution of packets of "Energy Food"

A special team consisting of a Nutrition Officer (Medical), Assistant Nutrition Officer, Deputy Health Education Officer, Health Supervisor, a Home Science graduate and a Lady Health Visitor (Nutrition Survey and Education Team), working closely with the Medical Officer of the PHC, coordinated the activities of the peripheral distribution centres at the block level. The team not only ensured a regular supply of stocks at the distribution centres but also acted as a liaison between the Nutrition Division of the Project at the State headquarters and the Primary Health Centre. Besides performing these managerial tasks, the team had technical responsibility of conducting baseline and evaluation surveys, motivating the mothers for adoption of better nutritional practices and family planning methods through nutrition and health education.

Role of National Institute of Nutrition :

The National Institute of Nutrition was closely associated with the Project in Karnataka. The Institute was actively involved in the formulation of the food supplement, which was developed and bulk produced by the Central Food Technological Research Institute, Mysore. All the various personnel of the nutrition wing at the District level, including the Medical officers of various PHCs, Nutrition Officer, Asst. Nutrition Officer, Health Supervisor, Dietetian and Lady Health Visitor were trained at the NIN for a period of two weeks. The training aimed at orienting them to nutrition problems and some of the practical aspects of field surveys. The Institute was also responsible for the evaluation of the nutrition component of the Project and for providing necessary guidance in the conduct of internal evaluation by the Project staff. The evaluation by the NIN was mostly carried out in the PHC of Thalak, pilot area selected by the Project authorities. In addition, the necessary educational aids were provided to carry out nutrition education activities in the Project.

CHAPTER 2

NUTRITION PROFILE OF THE COMMUNITY BASELINE SURVEY

N. PRALHAD RAO, K. VIJAYARAGHAVAN
A. NADAMUNI NAIDU and K. V. RAMESHWAR SARMA

A baseline survey was conducted at the beginning of the programme in September - October, 1974. The main objective was to collect relevant data on a representative sample in the pilot area (Thalak PHC) for the purpose of evaluation at a later date. The survey included collection of data on the following aspects:

1. Clinical examination for nutritional deficiency signs
2. Nutritional anthropometry
3. Haemoglobinometry
4. Diet survey, and
5. Vital statistics

Sample: For the purpose of nutrition and diet surveys, the investigations were carried out on pregnant women in the last trimester, lactating mothers in the first six months of lactation and children under the age of six years, while for vital statistics, information was obtained for a contiguous (subcentre) area with a population of about 6000 by making house-to house visits.

Sampling method: For the purpose of nutrition surveys, 22 villages were selected. The possible influence of the distance of the village from the distribution centre on the attendance of the beneficiaries was also considered in the selection of villages. Due consideration was likewise given to the size of the population of each village. In all the selected villages complete enumeration of all the available beneficiaries was attempted. In each village, a minimum of 5 house-holds, randomly selected, were covered for diet survey and haemoglobinometry. Diet survey and haemoglobin estimations were done on children, pregnant and lactating women. The details of the sampled villages are presented in Table 2. The list of the villages covered is presented in Table 3.

TABLE—2

Distribution of Villages by Population and Distance from Distribution Centre in Thalak PHC

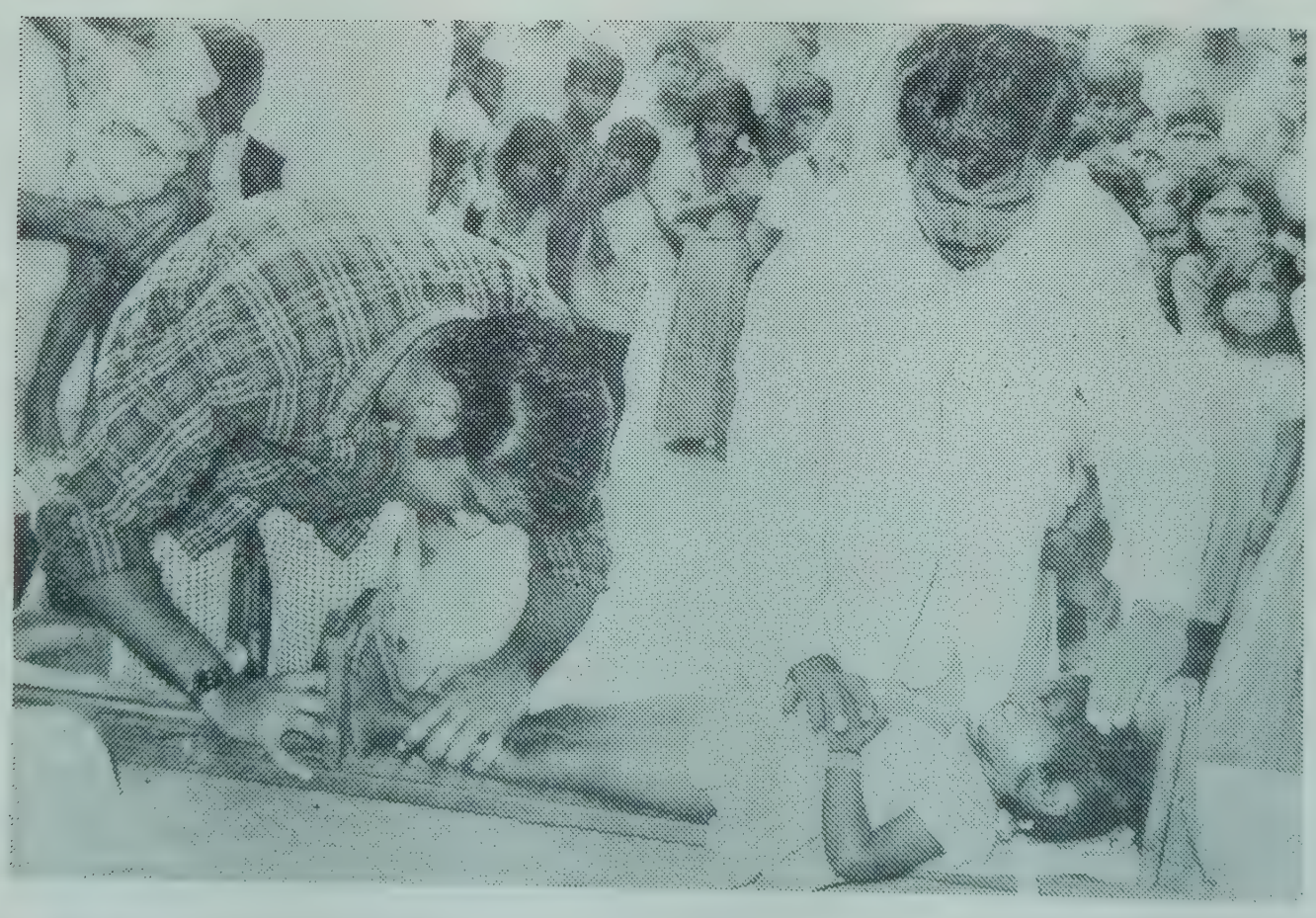
Distance of the villages from distribution centre (Km)	Population of the villages				
	less than 500	500 — 1000	1000 — 2000	2000 or more	Total
less than 2	7 (1)	4 (1)	16 (3)	4 (1)	31 (6)
3–4	15 (2)	13 (3)	6 (2)	—	34 (7)
5 or more	18 (3)	12 (2)	11 (3)	1 (1)	42 (9)
Total	40 (6)	29 (6)	33 (8)	5 (2)	107 (22)

TABLE—3

List of Villages Covered by Population and Distance from Distribution Centre

Distance of the villages from distribution centre (Km)	Population of the villages			
	less than 500	500 — 1000	1000 — 2000	2000 or more
less than 2	(1) Rekhalagiri Thanda	(1) Gowdagere	(1) Gajjagana Halli (2) Ghatparthi (3) Deva Reddi Halli	(1) Nerlagunte
3-4	(1) Giriyammana Halli (2) B. Hatti	(1) Volase (2) Thorekolammana Halli (3) Ramadurga	(1) Hanumanthana Halli (2) Kodi Halli	—
5 or more	(1) Bhimana Kere (2) Chikkollaharthy (3) Thippaiana Kote	(1) Kyathagondana Halli (2) Thimmana Halli	(1) Veeradimmana Halli (2) Honnur (3) Durgavara	(1) Mallur Halli

Clinical Examination of a preschool child



Measurement of recumbent body length with an infantometer

Measurement of mid-upper arm circumference

Diet Survey – Oral Questionnaire method (24 hr. recall)
using standardised cups

Collection of finger – prick blood for estimation of haemoglobin

Collection of data on Vital Statistics

Methods :

Clinical Examination : All the available subjects were clinically examined for the presence of nutrition deficiency signs.

Anthropometry : Height, weight, arm circumference and fat fold at triceps were taken on all the subjects using standardized methods and equipment[3]. Height was measured using an anthropometer rod and length was measured using an infantometer. Weight was taken on 'Jacobs' lever actuated balance. Mid upper arm circumference was measured with a fibre glass tape and fat fold at triceps was taken using Harpenden skinfold calipers.

Diet Survey : Using individual oral questionnaire method of diet survey, dietary intake for the previous 24 hours on all the children under 6 years of age, pregnant women and lactating mothers in each selected house-hold was assessed.

Haemoglobinometry : Finger prick samples of blood (20 μ l.) were collected using a standardized haemoglobin pipette on a filter paper disc (Whatman No. 1). The samples were sent to the Institute periodically for estimation. Care was taken to see that not more than a week elapsed between the dates of collection of blood samples in the field and haemoglobin estimation at the Institute. Haemoglobin was estimated by cyanmethaemoglobin method (Photo-electric colorimetry).

Vital statistics : House-to-house visits to all the familes were made in one sub-centre area covering a population of about 6.000 - which was earlier shown to be adequate for the purpose[4]. Information on the family composition according to age and sex was recorded on a specially designed proforma by trained investigators. Births and deaths during the previous one year were also noted indicating wherever possible the cause of death.

Results :

The Primary Health Centre Thalak in Chitradurga district with a population of about 98,000 in 110 villages formed the area of operation. The pilot area surveyed was essentially similar, in all respects, to communities surveyed elsewhere[5]. About 15% of the population was under the age of 5 years, with a birth rate of about 40 per 1000. The infant mortality rate in the area was 73, and pre-school child mortality rate was 18 per 1000 pre-school children. The growth pattern of the children indicated that there was considerable growth retardation among the pre-schoolers. About 60% of them were suffering from either moderate or severe degree of malnutrition. About 1.4% of pre-school children had severe forms of PEM. Sixty seven percent of pre-school children and 68% of pregnant women had haemoglobin levels indicative anaemia. The diets were deficient in most nutrients, particularly so with respect to calories, protein and vitamin A.

CHAPTER 3

DISTRIBUTION AND UTILIZATION OF SUPPLEMENTARY FOOD

N. PRALHAD RAO, K. VIJAYARAGHAVAN

In large scale community feeding programmes the commonly employed approaches are 'on the spot supervised feeding' and 'take home' food system. Relative merits and demerits of each method have been documented by various workers[6,7]. Of the two, the 'take home' approach though known to have a draw-back of almost certain diversion of the carry-home food to family members other than the target beneficiary, has been credited with certain advantages of being more practical, less expensive and safer than the 'on-the-spot' feeding approach. The latter approach, to be effective, however, needs not only the creation of special infrastructure but also carries with it the dangers of cross infection among malnourished population who are crowded together in feeding centres for a few hours in a day. Despite these distinct advantages of the 'take home' system, it has not been employed so far as a method of delivery of food supplements on a large enough scale (except in Project Poshak of Madhya Pradesh[8]) to merit public health evaluation. Hence a study was undertaken to evaluate the food distribution (Take home approach) that was being carried out as a part of the nutrition component of the project.

The investigation was undertaken towards the end of December, 1974 and beginning of January, 1975, primarily to study the utilization of the supplement by the benficiaries at the home level. The distribution had been in progress for about 4 months, and it was assumed that the initial problems had been overcome and the procedure had, therefore, become stabilised.

Sampling:

Since the distance of villages from the distribution centre ranged from zero (headquarter village of the distribution centre) to 7 Km, six to seven categories of villages were identified. Also, since the week day of distribution at a particular centre varied, villages were also categorised as belonging to one of the seven categories. Taking into account these two

criteria sampling of villages was done so as to include both the categories of villages 'distance-wise' and 'distribution-day-wise'. In each of the selected villages, an attempt was made to contact the beneficiaries by house to house visits.

Methods :

Keeping in view the objective, the content and the logistics of the programme, a questionnaire was evolved to obtain information on the attendance, consumption pattern of the supplement and acceptabillity of the programme by the community. The questionnaire was administered to women in their homes, who were either beneficiaries themselves, or were mothers of child beneficiaries.

The attendance of the beneficiaries was assessed by examining the health cards which had the date of registration and the total number of distribution days on which the supplement was collected.

Results:

A total of 200 women from 8 villages were interviewed and the data in respect of 96 mothers and 104 children were obtained. The distribution of the beneficiaries according to the distance of their village from the distribution centre and the n^{th} day of distribution (on the day of interview) is shown in Table-4.

Attendance: In general, two-thirds of the beneficiaries studied were found to attend for more than 80% of the distribution days a level that could be considered as satisfactory for a programme of this nature.

Among other factors, the distance of the village of the beneficiary from the distribution centre can be an important determinant of the extent and regularity of attendance at the centre. An attempt was, therefore, made to analyse the attendance data according to this criterion. The results (Table-5) showed that while nearly 95% of the beneficiaries from the head quarters villages (minimum distance) attended for more than 80% of the distribution days, none from the village situated 7 Km away from the centre had done so. However, no consistent inverse relationship between distance and attendance was observed, though a distance of more than 5 Km did adversely affect the attendance. All the interviewees of the village 'Kalva Halli' which was situated about 7 Km from the centre bitterly complained about the distance of the distribution centre from their village.

TABLE–4

Distribution of Beneficiaries According to the nth day of Distribution on the day of Interview

nth day of distribution on the day of interview	Name of village	Distance from distribution centre (km)	Number of beneficiaries covered		
			Mothers	Children	Total
2	Muchagunte	Hq	15	22	37
3	Hosahalli	1.6	9	5	14
	Rudrammanahalli	3	9	6	15
4	Gorla Katte	4	14	14	28
	Kalvehalli	7	10	8	18
5	Chikkahalli	Hq	15	25	40
	Thimmanahalli	5	19	15	34
6	Giriammanahalli	3	5	9	14
	Total		96	104	200

TABLE—5

Percentage Distribution of Beneficiaries According to Distance and Attendance

Distance (km) of village from distribution centre	% Attendance					Number of beneficiaries Studied
	80 or more	70–80	60–70	50–60	less than 50	
Hq	94.8	2.6	—	—	2.6	77
1.6	14.3	7.1	7.1	14.3	57.1	14
3	34.5	13.8	6.9	10.3	34.5	29
4	82.1	7.1	3.6	—	7.1	28
5	73.5	11.8	8.8	—	5.9	34
7	—	—	11.1	11.1	77.8	18
Total :	67.0	6.5	4.5	3.5	18.5	200

Consumption pattern of the supplements:

A great majority of mothers fed the supplement to children in the form of porridge or paste prepared with milk, while *roti* (unleavened bread) formed the commonest form of consumption in case of mother-beneficiaries. Occasionally, the supplement was consumed in raw powder form, or in the form of *Unde* (balls), *suji* and *upma*.

Only a small number of mothers had used the cup-measures for drawing the daily ration from the week's supply. They preferred to make use of their hands (handfuls) for measuring the day's need. In almost all instances, the preparation was cooked only once in a day and consumed at one sitting, except in the case of infants and very young children. The mothers often stated that the "leftovers" of the supplement of the young children were usually consumed by the older siblings.

An attempt was made to quantify the amount of supplements consumed by the beneficiaries over week days by measuring the actual quantity of the powder (in terms of cups) found at the homes of the beneficiaries at different points of time (Table-6) from the date of distribution. Nearly 70% of the beneficiaries did not have any stocks and another 18% had far less than what they should have had, on the 3rd day of distribution. Even on the 2nd day, nearly a third of the beneficiaries had either no stocks or less than the expected amounts. Almost all beneficiaries had exhausted the entire amount of the supplement by 5th day.

Sharing of the supplement by other members in the family:

Nearly 75% of the mothers interviewed stated that the supplement was shared by the other members in the family (Table 7). The sharing was found to be more frequent (80%) in case of mother beneficiaries as compared to child beneficiaries (66%). The most common sharers were children. More than 75% of children-sharers were between 3-6 years while the rest were beyond 6 years. In some of the families surveyed, though old women were found to occasionally share the supplement, in no instance, were adult men found to do so. In about 50% of the cases, usually one or two persons were found to share, while in more than 24% of cases the sharing was by three or more persons. In view of the widespread, generalized sharing no attempt was made to quantify the amounts consumed by each person. Assuming that the distribution of the supplement between the index and other children would be equal, it may be stated that on the average, the index beneficiary would have received only half to one-third or even less of the amount of the supplement provided to him/her under the programme. This would mean that the supplement instead of providing 200 calories to the child and 400 calories to the

TABLE—6

Percentage Distribution of Beneficiaries According to Stocks of Supplement by day of Distribution

nth day of distribution	No stock	Less than expected stock
2	18.9	35.1
3	70.6	88.2
4	67.9	75.0
5	73.0	77.0
6	100.0	100.0

TABLE–7

Distribution of Mother and Child Beneficiaries by Attendance and Number of Persons Sharing the Supplement

% Attendance	Mothers					Children				
	n*	Number of persons sharing				n*	Number of persons sharing			
		None	1	2	3 or more		None	1	2	3 or more
80 or more	60	10	12	23	15	68	27	22	11	8
70–80	4	...	2	1	1	7	2	2	1	2
60–70	3	...	...	...	3	5	...	1	3	1
50–60	4	...	...	4	...	3	2	...	1	...
Less than 50	23	7	3	4	9	15	5	5	1	4
Total:	94	17	17	32	28	98	36	30	17	15

* n = number of beneficiaries

mother, provided between 70 and 100 calories for the child and between 130 and 200 calories for the adult per day. These values, in many instances, would be much lower.

Distribution of beneficiaries according to number of persons sharing and attendance is shown in Table 7. Only about 10% of the mother-beneficiaries and 27% of child beneficiaries who attended for more than 80% of the distribution days, had exclusively consumed the supplement. These beneficiaries may be expected to show some change in their nutritional status while the other 90% of mothers and 73% of children are unlikely to show any improvement in their nutritional status as a result of the feeding programme.

Acceptability of the programme:

The programme was found to be acceptable to the community. More than 90% of the mothers liked the supplement. Less than 10% of the mothers stated that the children developed some gastro-intestinal disturbances in the initial stages, but they were quick to point out that this was transient and ceased very soon. About 2% of the mothers vaguely attributed skin eruptions and convulsions to the food. Several mothers stated that the food had helped in "clearing the oedema feet", "reducing the frequency of stools" and increasing the "weights" of their children.

In more than 75% of instances, it was usually a child between 8 and 14 years of age who visited the distribution centres for collecting the supplements. This observation is important in the context of one of the objectives of the project, which is to increase the contacts between the ANMs and the eligible mothers by the mothers coming to the centres to collect the food supplements.

Conclusions:

Distribution system: Although the evaluation of the distribution system of the programme was not the purpose of the present investigation, the survey provided an opportunity for the evaluating team to visit and observe the working of 7 distribution centres (including the PHC headquarters). On perusal of the records available at the centres and after discussions with both the functionaries and beneficiaries of the project, the team was convinced that the distribution system developed under the programme was operating with a high degree of efficiency. Except in an occasional centre, there was no major breakdown of the distribution system and the project personnel at all levels deserve to be congratulated for maintaining this efficient supply line from the production plant to peripheral distribution points.

Utilization of supplements :

The observation that nearly 65% of the total beneficiaries had attended for more than 80% of the distribution days was a clear indication that both the programme and the nature of food supplements were acceptable to the community. That a distance upto 5 Km from the distribution centre was not a deterrent, also appeared to have been established. Factors other than distance like the attitude of the workers towards villagers, the image of the para-medical workers in the eyes of the villagers and her capacity to influence the opinion makers of the villages etc. seemed to be equally responsible for willing co-operation of the people.

Despite a high percentage of beneficiaries attending for more than 80% of the total distribution days, its impact on parameters which measure nutritional status like increase in birth weights, better growth performance of infants and children, and reduction in the prevalence of frank cases of protein-calorie malnutrition is doubtful, because of the foilowing reasons :

1. The additional nutrients provided through the supplement in the programme fell short of the requirements of the specific groups by a considerable margin.

2. In 75% of the beneficiaries, the supplement was shared by one or more children. Assuming the sharing to be equal between the index children and others, the actual contribution by the supplement of calories works out to be less than 100 calories a day for children and less than 200 calories a day for adults In many instances, the figures would be even lower. These levels cannot be considered to meet the calorie gap existing in the current dietaries of these groups.

The beneficial impact of the programme may be expected to be observed in only a fifth or less of the beneficiary population - that segment which tended to be the regular and exclusive consumers of the supplement provided under the programme. This proportion is too small to make an impact on the total community.

Recommendations :

If one of the aims of the programme is nutritional upliftment of the vulnerable segments of the population, it is essential that the gap between nutrient requirement and current nutrient intake be adequately bridged. The food supplement, in fact, was formulated with this basic purpose in view. It had been pointed out even during the initial stages of the discussion of project plan, that the quantum of supplement i e. 55 g. for children and 110 g. for women proposed to be given covered only 60-65% of the deficit in the nutrient intake and to that extent was inadequate. The sharing

of the supplement was also not unexpected, and it was for this precise reason that the Institute decided to undertake this study, early in the course of the programme to quantitiate the extent of sharing and make suitable recommendations.

If the beneficiaries are to really benefit, it is necessary to increase the quantum of supplement both to the mother and the child, in amounts sufficient to take care of the sharing that goes on at home This would mean, in practice, that instead of the 6 to 24 month age group, which is now being covered, all children upto 5 to 6 years of age need to be included.

It is recognised that the food distribution system now being followed, may have non-nutritional benefits initially, which in the long run, may indirectly benefit nutritional status

CHAPTER 4

IMPACT ON NUTRITIONAL STATUS OF COMMUNITY

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Exactly at one year intervals till 1976 after the baseline survey, i.e. in 1975 and 1976 and in the year 1978, repeat surveys were conducted in all the 22 selected villages covering all the aspects studied at the time of the initial survey. The surveys were carried out in the months of September and October as in the case of bench-mark survey. The object of the re-survey was to determine whether there was any change in the nutritional status of the community due to the supplementary feeding programme. During the repeat survey attempts were also made to cover as many children as available for follow-up information especially on growth, so that annual increments in anthropometric parameters could be calculated and used for the purpose of evaluation.

The details of distribution of the sample covered under various investigations are presented in Table 8.

TABLE–8

Details of investigations and coverage

Investigation	Year of survey 1974	1975	1976	1978
(1) Nutrition survey				
a) Clinical Examination b) Anthropometry	1963	1878	1340	1516
(2) Haemoglobinometry	413	406	311	343
(3) Diet survey	247	240	231	—
(4) Vital statistics (population covered)	6000	6000	12000	12000

Results:

Deficiency Signs: The prevalence (%) of clinical signs is presented in Table 9.

The percent prevalence of severe degrees of PEM in the children surveyed showed a decreasing trend between the years 1974 and 1978. The prevalence of kwashiorkor came down from 0.7% at the time of base-line survey to about 0.1% in 1978. Similarly the percentage prevalence of marasmus was 0.3% in 1978 as against 0.7% before the programme was initiated. There was, however, a slight increasing trend in the prevalence of marasmus in 1975 and 1976.

The reduction in the prevalence of severe PEM can be considered a gain in the programme. It may be mainly attributed to the fact that under the programme, all severe cases of PEM, identified by the ANMs, received two packets of the supplement per week until the cases were cured completely. Better improvement particularly with respect to kwashiorkor cases can be explained possibly by the fact, that mothers readily fed these children in view of the presence of oedema and also because the calorie gap in these cases was, perhaps, much less as compared to that in marasmus. It is also possible that all the cases of marasmus were not brought to the notice of the ANMs, whereas because of oedema, cases of kwashiorkor were readily brought to the ANMs. Not withstanding this, it would have added to the benefit of the programme if concerted efforts had been made not only to identify all the severe cases of PEM properly but to educate mothers to feed these children regularly. In fact, some severe cases of PEM were completely cured with simple distribution of supplement, thus effectively convincing mothers of the usefulness of the supplement. This experience in the project in the treatment of severe cases of PEM could be considered as indicating the practicability of domiciliary management of such cases by properly oriented field workers at the village level. These findings confirm the results obtained earlier by the Institute in the domiciliary management of PEM[9].

The prevalence of vitamin A deficiency in children of 1-5 years did not show much of a change during the repeat surveys. There was, however, a reduction in the prevalence of ocular signs (Bitot spots) in the year 1975 as against that baseline survey. The extent of reduction was found to be significant when the simple method developed by the Institute was applied[10]. The regression coefficient between age and prevalence of Bitot spots in the preschool age group, though significantly different from zero, was not different from the population regression obtained under field conditions. During the subsequent years, these linear age trends in the

TABLE–9

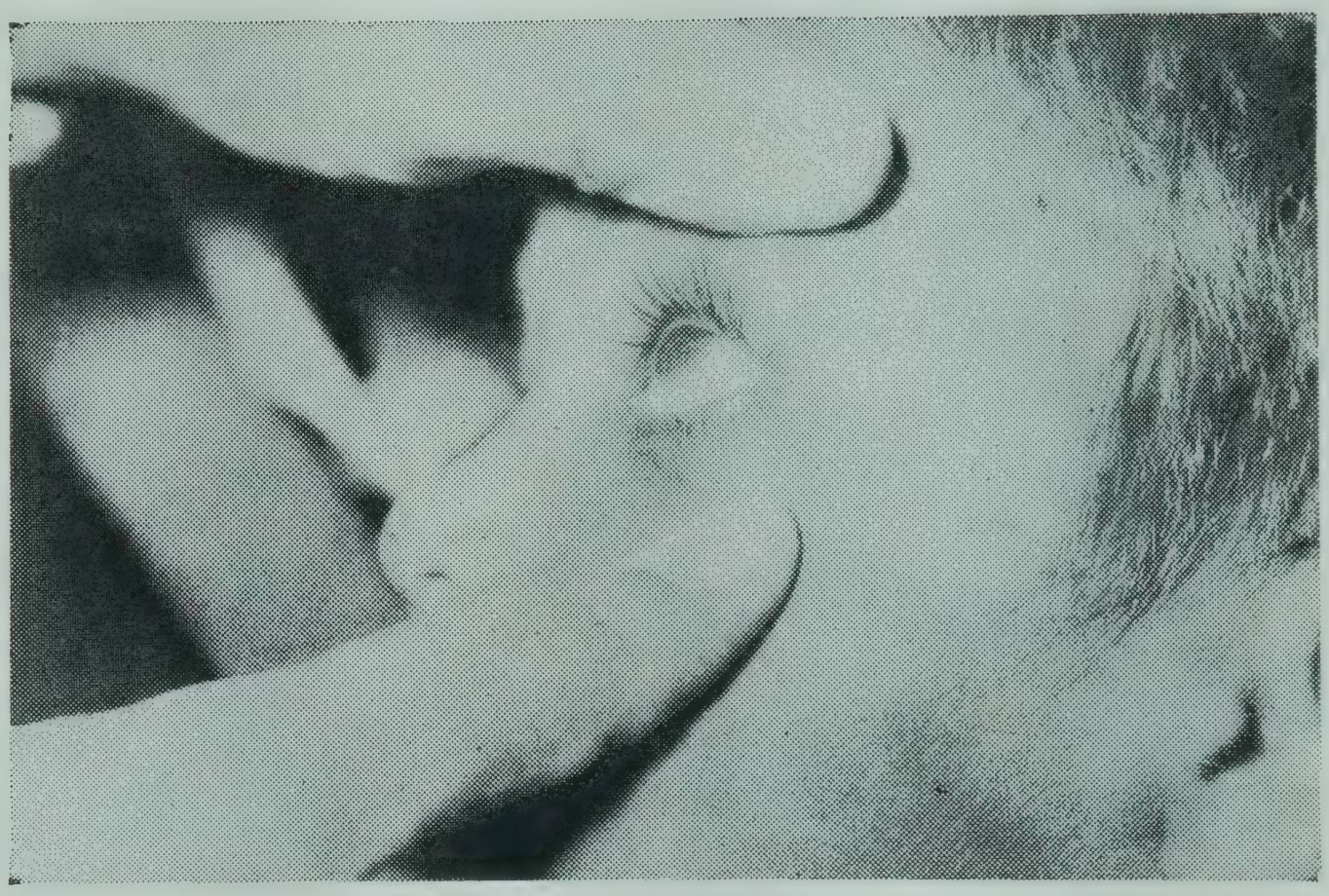
% Prevalance of Deficiency Signs

Age (years)	0–1				1–2				2–3				3–4				4–5				1–5			
Year of survey	1974	75	76	78	1974	75	76	78	1974	75	76	78	1974	75	76	78	1974	75	76	78	1974	75	76	78
n	275	315	186	83	300	309	210	210	300	259	225	352	332	248	198	309	270	243	202	231	1202	1059	835	1102
Without deficiency signs	87.3	78.1	95.1	84.4	70.0	44.7	81.0	61.9	70.3	46.7	71.6	65.3	69.3	55.2	62.1	66.3	68.9	54.7	58.4	57.6	69.6	49.9	68.5	63.3
Hair changes	2.5	0.3	0.5	7.2	5.0	1.6	0.5	13.3	6.0	0.4	0.9	10.8	2.7	...	0.5	4.2	1.5	...	...	2.6	3.8	0.6	0.5	7.7
Moon face	0.7	0.6	1.6	...	3.3	11.7	2.4	1.0	7.3	18.9	10.7	2.3	6.3	11.7	5.1	1.6	5.2	7.0	2.0	3.0	5.6	12.4	5.1	1.9
Emaciation	5.1	4.4	3.2	3.6	8.7	12.9	10.0	8.6	4.7	17.0	11.6	4.8	2.7	2.8	3.0	3.9	1.1	3.3	2.5	1.3	4.3	9.3	6.9	4.5
Oedema	...	...	...	...	...	...	0.5	1.0	2.0	0.4	...	...	0.6	1.2	1.0	...	0.4	...	...	...	0.7	0.4	0.4	0.1
Marasmus	1.8	1.0	...	1.2	1.0	3.2	2.9	0.5	1.0	0.8	0.4	0.6	0.3	0.4	0.5	0.3	0.4	...	...	...	0.7	1.2	1.0	0.3
2 or more signs of PCM	2.2	0.6	1.1	2.4	2.7	4.2	1.9	12.4	5.0	10.0	5.8	8.8	2.4	3.6	1.0	4.9	1.5	0.4	0.5	1.3	2.9	4.6	2.4	6.8
Conj, xerosis	...	...	...	...	...	...	0.5	...	0.7	0.8	0.4	0.3	0.9	2.0	2.0	...	0.4	5.3	1.5	0.9	0.5	1.9	1.1	0.2
Bitot spots	0.4	...	...	...	0.3	...	0.5	...	1.3	1.2	0.4	0.9	4.8	3.2	1.5	2.6	6.7	3.3	6.9	7.4	3.2	1.8	2.3	2.8
Angular Stomatitis	0.4	0.6	...	1.2	1.7	3.2	3.3	4.3	5.7	12.4	8.9	8.0	14.2	20.2	27.8	20.4	18.1	29.2	30.7	32.0	9.8	15.4	17.2	15.7

PROTEIN ENERGY MALNUTRITION

A child with swelling of face and limbs (Kwashiorkor)

A child with severe muscular wasting (Marasmus)



A case of Bitot's spot (Vitamin A deficiency)

prevalence were not obliterated. In other words, only during the 1st year of the programme, the supplement did seem to have a beneficial effect on the prevalence of vitamin A deficiency, inspite of the constant sharing of the supplement by children. The positive impact despite sharing could be explained by the fact that the supplement provided 400 μg of vitamin A per 100 g of the supplement. Even when a child consumed less than half the quantity of supplement given, it would have received 75-100 μg of vitamin A daily in addition to his home intake.

In the year 1976, as a result of the emphasis on family planning component, the offtake of the supplement was considerably reduced. In 1977, there was a change in the policy in the distribution of the supplement to children. Only those children whose parents had adopted some family planning method were eligible for the supplement. As a result of these factors, it appeared that impact of the supplement was not evident in 1976 and 1978 on vitamin A deficiency as during the survey in 1975.

Anthropometry : The mean values of anthropometric measurements are presented in Tables 10 and 11. The measurements at different points of time were found to be essentially similar. The use of mean values for purposes of comparison is sometimes considered fallacious, particularly when there are wide individual variations. Body weights were, therefore, expressed as percentage of standard weight for age[11] and the children classified according to the extent of deficit in weight for age. According to this (Gomez) classification[12], those who had a deficit of upto 10% are considered normal, those with deficit between 11 and 25% as suffering from grade I malnutrition, with deficits between 26 and 40% as suffering from grade II malnutrition and those with deficit above 40% as suffering from grade III malnutrition. The results of such a classification are presented in Table 12. About 60% of children had either grade II or grade III malnutrition at the time of the initial study and this figure had not changed during the resurveys.

Annual increments in anthropometric measurements are presented in Table 13. As the growth pattern of these children was found to be similar to that of rural Hyderabad children, the annual increments in height and weight observed on them[13] and the values obtained in the project area were compared. The increments were essentially similar in the two groups. A comparison of the annual increments in anthropometric measurements obtained in the years 1975 and 1976 (Table 14) revealed no differences and these were comparable to those obtained elsewhere.

Haemoglobin levels : The results of haemoglobinometry are presented in Table 15.

TABLE–10

Anthropometric Measurements—Males

Age (Years)	1974				1975				1976				1978			
	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)
1–2	71.59* ± 0.3549	7.59 ± 0.0996	12.74 ± 0.1021	6.60 ± 0.1274	71.16 ± 0.3566	7.44 ± 0.1108	12.72 ± 0.1124	6.80 ± 0.9180	71.33 ± 0.5057	7.48 ± 0.1347	12.51 ± 0.1346	6.49 ± 0.1526	71.22 ± 0.4044	7.99 ± 0.4971	12.02 ± 0.1689	6.60 ± 0.1922
2–3	77.30 ± 0.3966	8.74 ± 0.1230	13.14 ± 0.1026	7.48 ± 0.1549	77.56 ± 0.4146	8.78 ± 0.1228	13.29 ± 0.1170	7.87 ± 0.1906	77.67 ± 0.5104	8.84 ± 0.1431	12.99 ± 0.1298	7.29 ± 0.1770	78.07 ± 0.6183	8.95 ± 0.1398	12.90 ± 0.1057	7.76 ± 0.1422
3–4	83.99 ± 0.4523	10.35 ± 0.1298	13.80 ± 0.0991	8.08 ± 0.1421	84.28 ± 0.4402	10.35 ± 0.1308	13.79 ± 0.1035	8.49 ± 0.1779	84.94 ± 0.6376	10.65 ± 0.1797	13.88 ± 0.1333	8.62 ± 0.2024	85.74 ± 0.7768	10.51 ± 0.1504	13.40 ± 0.8358	8.49 ± 0.1417
4–5	91.40 ± 0.5173	11.92 ± 0.1488	14.18 ± 0.0936	8.10 ± 0.1798	90.20 ± 0.6038	11.72 ± 0.1304	14.16 ± 0.0977	8.35 ± 0.1743	92.10 ± 0.5112	12.06 ± 0.1463	14.16 ± 0.0992	8.16 ± 0.1840	91.87 ± 0.5480	12.16 ± 0.1436	13.80 ± 0.1363	8.32 ± 0.1623

* Mean ± SE

TABLE–11

Anthropometric Measurements—Females

Age (Years)	1974				1975				1976				1978			
	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumfere nce (cm)	Fat-fold at triceps (mm)
1–2	70.76* ± 0.3552	7.22 ± 0.0965	12.49 ± 0.1042	6.79 ± 0.1455	70.46 ± 0.3202	7.20 ± 0.0958	12.68 ± 0.1072	7.37 ± 0.1468	69.62 ± 0.4523	6.94 ± 0.1294	12.25 ± 0.1437	6.72 ± 0.1785	70.43 ± 0.4838	7.55 ± 0.5645	11.90 ± 0.1271	6.81 ± 0.2017
2–3	77.32 ± 0.3625	8.55 ± 0.1182	13.03 ± 0.1032	8.00 ± 0.1642	76.79 ± 0.3984	8.37 ± 0.1125	12.90 ± 0.1522	7.77 ± 0.1787	77.02 ± 0.5030	8.67 ± 0.1487	13.00 ± 0.1397	7.92 ± 0.2026	76.83 ± 0.3923	8.39 ± 0.1087	12.56 ± 0.0944	8.22 ± 0.1578
3–4	83.51 ± 0.4183	10.10 ± 0.1440	13.62 ± 0.0919	8.98 ± 0.1620	82.88 ± 0.4838	10.17 ± 0.1321	13.91 ± 0.1100	9.32 ± 0.1824	84.46 ± 0.5538	10.41 ± 0.1758	13.83 ± 0.1269	8.89 ± 0.1840	84.15 ± 0.5780	10.17 ± 0.1568	13.29 ± 0.1198	8.85 ± 0.2007
4–5	90.46 ± 0.4382	11.64 ± 0.1243	14.20 ± 0.0913	8.82 ± 0.1598	90.86 ± 0.5945	11.72 ± 0.1422	14.29 ± 0.1005	9.08 ± 0.1772	91.43 ± 0.4870	11.87 ± 0.1354	14.34 ± 0.0981	9.08 ± 0.1957	91.74 ± 0.6020	11.98 ± 0.1545	14.02 ± 0.9841	9.15 ± 0.2303
Pregnant women	152.48 ± 0.9889	44.85 ± 0.8863	21.04 ± 0.2539	6.94 ± 0.2909	152.33 ± 0.7133	46.17 ± 0.6204	21.73 ± 0.1732	8.18 ± 0.2906	153.80 ± 2.9863	48.95 ± 2.6313	21.63 ± 0.3676	8.20 ± 0.5750				
Lactating women	152.87 ± 0.4773	41.28 ± 0.4132	21.47 ± 0.1561	7.58 ± 0.2775	152.70 ± 0.5253	42.31 ± 0.4121	21.79 ± 0.1318	8.48 ± 0.2071	152.79 ± 0.7461	43.13 ± 0.8133	22.18 ± 0.2369	8.85 ± 0.4173				

* Mean ± SE

TABLE–12

Percent Distribution of Preschool Children According to Body Weight*

Age (yrs.)	1974					1975					1976					1978				
	n	N	I	II	III	n	N	I	II	III	n	N	I	II	III	n	N	I	II	III
1–2	300	6.4	36.3	45.3	12.0	309	8.8	31.7	42.7	16.8	210	4.8	28.1	49 0	18.1	210	5.3	26.2	47.1	21.4
2–3	300	9.3	31.7	45.3	13.7	259	6.6	37.5	43.2	12.7	225	7.1	36.0	40.9	16.0	352	8.8	30.1	42.3	18.8
3–4	332	7.5	36.8	44.0	11.7	248	5.6	35.9	48.8	9.7	196	9.2	36.2	45.4	9.2	309	9.0	33.7	40.5	16.8
4–5	270	3.7	31.5	55.2	9.6	243	4.1	31.3	50.6	14.0	202	5.5	40.2	49.5	4.4	231	7.3	41.6	47.2	3.9
1–5	1202	6.8	34.2	47.2	11.8	1059	6.4	34.0	46.1	13.5	833	6.6	35.2	46.1	12.1	1102	7.9	32.8	43.7	15.6

N = 90% or more of Standard weight* for age
I = 75–90% of Standard weight for age
II = 90–75% of Standard weight for age
III= Less than 60% of Standard weight for age

*% of Hyderabad well–to–do children

TABLE–13

Annual Increments in Anthropometric Measurements of Children

MALES	1974–75				1975–76				FEMALES	1974–75				1975–76			
Age (Years)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)
0–1	9.7840 ± 0.5008	1.7023 ± 0.1356	0.5909 ± 0.1983	0.0727 ± 0.2594	9.4931 ± 0.5709	1.6000 ± 0.1534	0.2793 ± 0.1559	0.0966 ± 0.2556	8.9111 ± 0.5600	1.4178 ± 0.2309	0.2500 ± 0.1499	0.2364 ± 0.2315	9.3892 ± 0.5950	1.4081 ± 0.1584	1.0459 ± 0.1976	0.0676 ± 0.3239
1–2	6.6160 ± 0.3034	1.3420 ± 0.1291	0.5240 ± 0.2202	1.1500 ± 0.3113	6.5827 ± 0.3261	1.4442 ± 0.1385	0.3346 ± 0.1619	0.5308 ± 0.2229	6.9933 ± 0.3532	1.3400 ± 0.1229	0.5089 ± 0.1489	0.9578 ± 0.2639	7.3487 ± 0.3626	1.6179 ± 0.1631	0.4949 ± 0.1342	0.7949 ± 0.3257
2–3	6.5380 ± 0.2817	1.5980 ± 0.1186	0.6200 ± 0.1308	1.1660 ± 0.2789	7.3282 ± 0.3239	1.8487 ± 0.1495	0.4128 ± 0.2149	1.0821 ± 0.3379	6.7245 ± 0.3158	1.7245 ± 0.1655	0.9918 ± 0.1327	1.5204 ± 0.2585	6.9121 ± 0.3362	1.5970 ± 0.1992	0.8121 ± 0.1664	0.9818 ± 0.3202
3–4	6.7528 ± 0.2806	1.3755 ± 0.1205	0.3623 ± 0.1395	-0.2038 ± 0.2480	7.1538 ± 0.3143	1.5577 ± 0.1224	0.3538 ± 0.1469	0.0346 ± 0.3217	6.7904 ± 0.2204	1.2808 ± 0.1251	0.4712 ± 0.0997	-0.0923 ± 0.2681	7.2861 ± 6.2761	1.4139 ± 0.1595	0.0500 ± 0.1341	-0.6889 ± 0.3042
4–5	6.4216 ± 0.1932	1.4757 ± 0.1022	0.3081 ± 0.1131	-0.1189 ± 0.2143	6.1718 ± 0.2466	1.3230 ± 0.1165	0.0821 ± 0.1274	-0.7077 ± 0.1897	6.8884 ± 0.2086	1.5558 ± 0.0934	0.5326 ± 0.1216	-0.2837 ± 0.2728	6.7756 ± 0.1639	1.5000 ± 0.0888	0.3222 ± 0.1156	-0.6733 ± 0.2379
5–6	6.2600 ± 0.2982	1.5333 ± 0.1225	0.3633 ± 0.1042	0.3967 ± 0.3124	6.1500 ± 0.2164	1.4083 ± 0.0960	-0.1604 ± 0.0616	-1.0292 ± 0.1797	5.5040 ± 0.2909	1.4440 ± 0.1716	0.3240 ± 0.1534	-0.4160 ± 0.2800	5.9448 ± 0.1815	1.6103 ± 0.1854	0.1103 ± 0.1043	-0.9862 ± 0.2459
6–7	5.7471 ± 0.2933	1.4235 ± 0.1760	0.4412 ± 0.1713	-0.2941 ± 0.4055	5.6545 ± 0.2435	1.4409 ± 0.2105	0.3091 ± 0.1116	-0.5955 ± 0.1696	5.9800 ± 0.4213	1.2600 ± 0.1249	0.2100 ± 0.2273	-0.3400 ± 0.4402	6.9290 ± 0.2753	1.4429 ± 0.2040	0.2286 ± 0.1567	-0.4857 ± 0.4102

* Mean ± S.E.

TABLE–14

Annual Increments* During I and II Years of Project

MALES									FEMALES								
	I follow up				II follow up					I follow up				II follow up			
Age (Years)	n	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Age (Years)	n	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)	Height (cm)	Weight (kg)	Arm circumference (cm)	Fat-fold at triceps (mm)
0-1	17	9.2765± 0.8060	1.4941± 0.2099	0.2706± 0.3774	−0.3529± 0.4739	6.5706± 0.5742	1.5588± 0.1890	0.4588± 0.3337	0.3529± 0.5457	0-1	11	9.0455± 1.1400	1.4909± 0.2222	0.5545± 0.1937	0.4000± 0.5546	8.2727± 0.6027	1.8182± 0.3153	0.7818± 0.1623	1.4182± 0.3995
1-2	18	6.6111± 0.5878	1.4056± 0.2019	0.8500± 0.3699	1.7111± 0.5897	6.9889± 0.4355	1.6389± 0.1817	0.3833± 0.2797	0.6000± 0.4886	1-2	19	7.5474± 0.4576	1.0895± 0.1860	0.2526± 0.2678	0.5316± 0.4677	6.4158± 0.4068	1.5526± 0.2270	0.6579± 0.2463	1.1211± 0.4290
2-3	14	7.0643± 0.3759	1.6643± 0.1536	0.2714± 0.2543	0.8286± 0.4650	7.4214± 0.4654	1.7071± 0.1768	0.2714± 0.2113	−0.5929± 0.4251	2-3	20	6.5800± 0.4621	1.5150± 0.3228	0.9750± 0.1727	1.7550± 0.2721	7.5700± 0.3486	1.6250± 0.1602	0.2850± 0.1486	0.2300± 0.3364
3-4	19	6.3053± 0.4217	1.2000± 0.1296	0.2947± 0.0843	−0.2526± 0.3480	6.1211± 0.3539	1.2421± 0.1874	−0.1105± 0.1684	−0.8526± 0.2961	3-4	24	6.6667± 0.3339	1.7080± 0.1655	0.3292± 0.1624	−0.4500± 0.3376	6.6542± 0.1893	1.5625± 0.1073	0.3083± 0.1754	−0.5083± 0.3266
4-5	20	6.3450± 0.2873	1.3700± 0.1473	0.2000± 0.1031	−0.0309± 0.1586	5.8500± 0.3039	1.2450± 1.1377	−0.1850± 0.1134	1.2000± 0.2982	4-5	19	6.7737± 0.3934	1.3842± 0.1400	0.2842± 0.1250	−0.9579± 0.3163	6.2105± 0.1936	1.5211± 0.1384	0.1737± 0.1034	−0.7684± 0.1900
5-6	17	6.0706± 0.4480	1.4706± 0.1599	0.4000± 0.1339	−0.2059± 0.2660	5.6412± 0.2968	1.4235± 0.2185	0.3882± 0.1172	−0.5824± 0.1737	5–6	9	5.7333± 0.5505	1.3889± 0.2557	0.2667± 0.2363	−0.8222± 0.5892	6.0333± 0.4137	1.7222± 0.2356	0.2667± 0.1965	−0.7556± 0.4908

* Mean ± SE

TABLE–15

Percent Distribution of Children According to their Haemoglobin Levels

Hb. g/dl	Baseline	1975	1976	1978
Less than 7	2.0	3.9	3.8	2.4
7–9	16.6	15.0	15.8	12.8
9–11	40.2	35.2	43.4	37.0
11 or more	41.2	45.9	37.0	47.8

There was no significant difference in the mean haemoglobin levels between those at the baseline survey and the repeat surveys. However, there appeared to be a small but consistent shift to the right in the frequency distribution of haemoglobin levels in pre-school children in 1975. During the survey in 1976 and 1978 no such shift was evident.

The trend in improvement of haemoglobin levels among pre-school children. though small, should be considered a nutritional benefit of the programme. This may be explained on the basis of the fact that even after sharing, a child would have received 3-4 mg of iron daily through the supplement as 100 g of the supplement provided about 15 mg of iron.

Diets : There was no significant change in the diets of the subjects between different points of survey (Table 16).

Vital statistics : Demographic particulars of the subcentre area surveyed for vital statistics are presented in Table 17. Data obtained were similar to that reported for other rural communities of the country. The repeat survey indicated that the vital rates had not altered to the better at the end of the year. There was in fact, a slight rise in mortality rates, the increase being particularly seen in the pre-school age group.

However, there appeared to be a significant reduction in the crude birth rate which declined from about 40 in 1974 to about 26 in 1978. The reason for the fall in crude birth rate could, perhaps, be attributed to the better acceptance of family planning by the community after 1976-77. It may be mentioned here that during the year 1976-77 Chitradurga district ranked number one in the state of Karnataka in the achievement of family planning targets. It is difficult to comment on the actual role of the supplementary feeding programme – especially after the altered strategy of including beneficiaries only from the families of FP acceptors – on the acceptance of family planning methods.

However, there did not appear to be any change in the mortality rates, which actually increased slightly. In view of the absence of any striking impact of the supplementary feeding programme either on the growth or the overall nutritional status of the children, the absence of any change in mortality rates is not surprising. Slight increase in the mortality rates may be due, apart from causes like seasonal epidemics, to the fact that the information collected in 1975 onwards was based on follow up data of the families as against that in 1974 which was based on one point retrospective data.

TABLE–16

Nutrient Intake

	Children												Pregnant women			Lactating mothers		
	1–2 years			2–3 years			3–4 years			4–7 years								
	1974	1975	1976	1974	1975	1976	1974	1975	1976	1974	1975	1976	1974	1975	1976	1974	1975	1976
Protein (g)	20.7	14.2	19.1	24.5	22.8	24.3	28.1	26.4	33.6	39.7	33.6	33.9	60.1	50.3	45.5	52.5	51.6	39.9
Calories	767	534	651	977	855	950	1033	1019	1235	1456	1271	1288	1960	1817	1797	2012	1972	1686
Calcium (mg)	622	435	449	669	641	782	568	824	943	895	861	952	1306	1328	1359	1167	1390	1293
Iron (mg)	12.0	7.1	10.8	18.1	15.2	16.1	18.0	17.3	23.2	27.8	23.0	23.5	37.0	33.8	33.1	36.1	36.7	30.9
Vitamin A(μg)	126	106	107	123	106	123	115	148	150	210	154	186	260	198	242	230	216	147

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TABLE–17

Vital Rates

Demographic Particulars	1974	1975	1978
Birth Rate (births/1000 population)	39.7	42.5	25.7
I. M. R. (infant deaths/1000 live births)	72.9	82.5	84.8
Pre–school mortality rate (age specific)	18.3	25.2	24.7
C. D. R. (deaths of all ages/1000 population)	—	13.4	10.0
% Proportional mortality (Proportion of deaths of 0–5 years to total)	—	45.7	50.0

Child weaning practices:

One of the factors responsible for the high prevalence of PEM in these communities is the mother's firm belief that breast milk alone is enough for the child until he is atleast one year old and their reluctance to introduce solid food supplements early. At the time of baseline survey, all the infants under six months of age and about 45% of the children between 6-12 months of age were completely breast fed. During the repeat survey in 1975, it was observed that 8% of children under six months of age also were being given some supplements in addition to breast milk (Table 18). The mother usually shared her supplement with her infant. A similar practice of introducing supplements (in addition to breast milk) was also noticed among the children between 6-12 months of age. As against 54% children who received supplements in addition to breast milk at the initial visit, 7o% of children received supplements and breast-milk during the resurvey. These changes in the child feeding practices could be considered as "positive" in the sense that the project could motivate a small, yet significant, number of mothers to introduce solids early. Efforts should be made to sustain these desirable practices. The importance of following hygienic measures of feeding the supplement, must be emphasised on the mothers, as otherwise gastrointestinal infections might offset the beneficial effects.

Comment : From the above, it is evident that there appeared to be no impact of the feeding programme on the nutritional status of the beneficiaries This, however, was not unexpected in view of the findings of an earlier interim evaluation carried out by the Institute. The report (vide chapter 3) indicated clearly that though the feeding programme was run efficiently and was well accepted by the community, there was uniform and universal sharing of the supplement by other children. In fact, only about 30% of the child beneficiaries and about 10% of mother beneficiaries were consuming the supplment exclusively and regularly. Also, even in those, who did consume the supplement exclusively it did not completely bridge the existing calorie gap in the dietaries of the beneficiaries. During the year 1976, there was change in the approach in the family planning programme in the state of Karnataka in general, and the district in particular, with emphasis on the achievement of the targets. To attain this, departments other than the Health department like Revenue were also involved. As a result, though the performance with respect to family planning targets was very good (Chitradurga in the year 1976 ranked 1st in the state in family planning performance), the nutrition programme was affected considerably. As a result of resentment by the community, the offtake of the supplement after December, 1975 fell considerably (Table 19). As against an offtake of about 13.5 tonnes in August, 1975 to cover about 9000 mothers and 16000 child beneficiaries, it fell down to less

TABLE–18

Percent Distribution of Children According to Feeding Practices

	1974						1975					
	Less than Six Months	6M–1Y*	1–2Y	2–3Y	3–4Y	4–5Y	Less than Six Months	6M–1Y	1–2Y	2–3Y	3–4Y	4–5Y
Breast–fed only	100	45.9	2.0	0.5	—	—	92.0	23.3	1.4	—	—	—
Breast–fed + supplements	—	54.1	88.0	53.8	19.8	4.9	6.7	76.7	87.1	31.0	9.0	1.7
Not breast–fed (Fully weaned)	—	—	10.0	45.7	80.2	95.1	1.3	—	11.5	69.0	91.0	98.3

* M = Months, Y = Years

TABLE–19

Off–Take of the Energy Food (Tons)

Month	Year	In the villages surveyed	Whole of PHC	Total Beneficiaries		
				Mothers	Children	
					Normal	PCM
August	1975	3.29	13.50	9146	16221	136
September	1975	2.98	12.23	8552	14106	139
October	1975	3.11	12.30	8649	14074	140
November	1975	2.82	11.42	8061	13084	121
December	1975	2.34	9.81	6667	11698	114
January	1976	2.11	9.01	6101	10768	115
February	1976	1.53	6.67	4677	7586	120
March	1976	1.16	5.43	3795	6190	99
April	1976	1.22	5.61	3865	6475	96
May	1976	1.33	6.58	4556	7635	99
June	1976	1.47	6.50	4592	7268	115
July	1976	1.63	7.59	5315	8586	134
August	1976	1.63	7.66	5317	8718	142
September	1976	1.65	7.69	5445	8496	153

than 6 tonnes in April 1976. Though it improved slightly by July-August, 1976, the coverage of beneficiaries was about half of the eligible. Thus, this could be attributed to be one of the important reasons for lack of impact of the supplement on the nutritional status.

It was also observed that many of the target beneficiaries were not receiving supplements owing to failure on the part of the functionaries to update the registration of newer cases.

Summary and Recommendations:

1. The results of this study showed that the nutrition component of the project though no doubt did bring out marginal beneficial effects, like reduction in prevalence of PEM and vitamin A deficiencey signs etc., had not made any significant impact on the growth status of the community in general. The absence of improvement in growth status, infact, confirmed the doubts expressed by the Institute earlier that the 'take home' approach was unlikely to be beneficial if older children upto the age of six years were not covered, because of the sharing of the supplement. Also, the quantum of food supplements given, was inadequate even if there was no sharing.

Hence, it was recommended that the supplementary feeding should be extended to all children under six years. This, however, could be limited to a small area initially and attempts be made to evaluate whether the anticipated beneficial impact on nutritional status can be demonstrated.

Since many pregnant and lactating women were not receiving the supplements because of the failure in updating the list of beneficiaries, efforts should be made to streamline this to achieve the expected results.

2. Keeping in view the spin-off benefits of the programme (like better image of the ANM, willingness to get children vaccinated etc.) that have been shown to accrue as a result of the programme (vide chapter 6), the auxiliary workers may be advised to make full use of such a beneficial situation in proper implementation of MCH services like immunization of all the target children, prenatal care of the mothers etc.

3. The evaluation indicated that the programme induced more mothers to start solid supplements as earley as 6-12 months. Efforts should now be made to consolidate the gains achieved by the progromme in the area of child feeding practices by appropriate nutrition education of the mothers.

4. One of the measures of success of the programme lies in preventing the occurrence of severe cases of PEM like kwashiorkor and marasmus in the community. Also, successesful management of such cases at

at home level by the peripheral workers using the supplement constitutes an important aspect of considerable value. As such it is recommended that a simple system of monitoring these severe cases through active involvement of Medical Officer of PHC and auxiliary workers be followed. The followup should be backed by appropriate nutrition education of the mothers for achieving permanent gains in the field of child nutrition.

CHAPTER 5

IMPACT OF ALTERED STRATEGY OF DISTRIBUTION OF SUPPLEMENTARY FOOD

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A. NADAMUNI NAIDU and K. V. RAMESHWAR SARMA

In the year 1977 the implementation strategy of the progremme underwent two important modifications; (a) only children whose parents accepted a permanent family planning methods were entitled to receive the supplement as against the universal coverage followed earlier; and (b) children between the ages of 6 to 60 months were given the supplements as against 6 to 24 months earlier. Children suffering from severe forms of PEM (kwashiorkor and marasmus) continued to receive the benefits of the Programme whether or not their parents accepted family planning measures.

The following investigations were carried out during the year 1978, after the new strategy had been implemented for a period of more than a year, to find out whether there was any impact of such a strategy on nutritional status of chiidren;

i) Nutritional status through clinical examination and anthropometry.

ii) Haemoglobin status by Cyanmethhaemoglobin method using filter paper.

iii) Consumption pattern of take-home supplement to assess the distribution of the supplement after the altered strategy and

iv) Vital statistics.

Sampling procedure and the investigation methodology adopted were similar to those adopted on earlier occasions. During the survey attempts were made to include both the 'beneficiary' children and the non-beneficiary children. The 'beneficiary group' consisted of children who had received the supplementary food and were from the families of the family planning acceptors. The "non-beneficiary group" were those who were not receiving the energy food.

Results

Attendance and consumption pattern:

A total of one hundred and fifty two children from 101 households were covered for the purpose.

About 96% of beneficiaries were found to attend the distribution centres for more than 90% of distribution days — a figure higher than the 60 to 70% attending for 80% of distribution days observed earlier, when the coverage was universal. Sharing of the food supplement was observed in about 75% of the housholds, the sharers being mostly children between 5 and 10 years of age. In a few households even children beyond the age of 10 years shared the food.

The commonest form in which the supplements were consumed by younger children was porridge or paste prepared with milk, while older children and mother beneficiaries consumed it as *roti* (unleavend bread).

These findings show that the inclusion of all children upto five years of age in the feeding programme did not reduce the sharing of the supplement to any significant extent.

Anthropometry:

Mean values of body measurements such as weight, height, arm circumference and fat fold at triceps in respect of beneficiary and non-beneficiary groups of children are given in the Table-20. No differences in any of the body measurements were seen between the two groups of children. Also, the measurements were essentially similar to those obtained on earlier occasions.

Since the use of mean values for the purpose of comparison can be misleading, particularly when there are wide individual variations, an attempt was made to classify children into various grades of malnutrition using the criteria of weight-for-age deficit (Gomez classification)[12]. The results of such a classification (Table-21) showed that there were no marked differences in the distribution of children according to the body weight deficits between the beneficiary and non beneficiary groups of children.

Deficiency signs :

Table-22 presents the per cent prevalence of nutritional deficiency signs. The prevalance of Bitot's spots was lower in the beneficiary (1.7%) group of children as compared to the non-beneficiary group (3.0%). The prevalance of angular stomatitis, however, was of the same order (16%)

TABLE–20

Mean Anthropometric Measurements of Beneficiary and Non–beneficiary Children by age and sex

	MALES						FEMALES				
	n	Height (cm)	Weight (kg)	A. C. (cm)	F. F. T.** (mm)	Age (years)	n	Height (cm)	Weight (kg)	A. C. (cm)	F.F.T. (mm)
Beneficiary	4	68.4±5.04	6.7±1.60	11.7±1.33	7.3±1.62	0–1	6	66.3±3.40	66.8±0.80	12.1±1.10	6.9±1.30
Non–beneficiary	32	65.6±5.14	6.4±1.10	12.7±2.70	7.2±1.80		41	64.1±4.10	6.0±1.04	11.9±1.40	5.9±1.40
Beneficiary	40	72.5±4.70	7.4±1.38	12.1±1.50	6.9±2.20	0–2	32	70.1±5.20	7.0±1.90	11.8±1.34	6.5±1.60
Non–beneficiary	80	70.6±4.20	8.0±6.60	12.0±2.0	6.4±2.07		58	70.5±4.20	7.8±6,50	11.9±1.10	6.9±2,05
Beneficiary	80	77.6±5.90	8.6±1.60	12.6±1.38	7.8±2.01	2–3	73	77.0±5.60	8.4±1.40	12.7±1.10	8.4±2.20
Non–beneficiary	86	78.4±9.40	9.2±1.90	13.2±1.30	7.8±1.60		113	76.2±8.10	8.3±1.50	12.5±1.10	7.9±2.12
Beneficiary	61	83.1±6.20	10.40±1.80	13.2±1.10	8.4±2.14	3–4	53	83.6±7.10	10.0±1.80	13.2±1.40	8 8±2.40
Non–beneficiary	114	87.1±11.70	10.70±2.04	13.4±1.10	8.4±1.73		81	84.5±6.40	10.2±1.80	13.3±1.30	8.9±2.20
Beneficiary	35	91.0±5.10	11.9±1.50	13.8±0.90	8.4±1.30	4–5	34	91.1±7.60	11.6±1.20	13.9±0.90	9.0±2.00
Non–beneficiary	89	92.2±6.44	12.2±1.63	13.8±1.70	8.2±2.0		73	83.3±9.50	12.1±1.70	14.0±1.10	9.2±2.50

* A.C. = Arm circumference **F.F.T.: Fat fold at triceps

TABLE–21

Distribution of Children According to Grades of Malnutrition

	Weight for age as % of standard*	Beneficiaries (Total 408)	Non–beneficiaries (Total 694)
Grade III	Less than 60	19.4	13.2
Grade II	60–75	43.0	44.3
Grade I	75–90	29.7	34.6
Normal	90	7.9	7·9

* Well to do Hyderabad children.

TABLE–22

Prevalence (%) of Nutritional Deficiency Signs

	Kwashiorkor	Marasmus	Bitot's spots	Angular stomatitis	Total surveyed
Beneficiary	0.25 (1)	1.4 (6)	1.72 (7)	16.18 (66)	408
Non–beneficiary	0.29 (2)	0.43 (3)	3.03 (21)	15.71 (109)	694

Figures in the paranthesis indicate number observed.

in both groups. Of the two severe forms of PEM, the prevalence of kwashiorkor was similar in the two groups but the prevalence of marasmus was found to be more in the beneficiary group of children. This needs an explanation and may be due to the deliberate inclusion of such children to help them benefit from the programme.

Haemoglobin status:

The distribution of beneficiary and non-beneficiary groups of children according to haemoglobin levels and mean values of haemoglobin are given in Tables 23 and 24. There were no significant differences between the groups either in the mean haemoglobin levels or in the frequency distribution of haemoglobin levels. The mean haemoglobin levels were similar to those seen at the time of the basal survey.

Vital Statistics:

Vital Statistics rates such as, birth rate, death rate, IMR, preschool mortality rate and proportional mortality rate (deaths under five years) have been given in Table 17. All the vital rates, except birth rate, observed during the current study are similar to those observed during the 1975 survey. Birth rate during the current year i. e., 1978, was 25.7 as compared to 42.5 per 1000 population in 1975. The marked reduction in the birth rate could be due to a greater acceptance of family planning measures by the population as a result of active implementation of the family planning programmes during the years 1976-77 in the area.

Conclusions:

The altered strategy employed in the food distribution, resulted in improved coverage (95%) and improved attendance (90%) in the feeding programme. It has, however, not reduced the extent of sharing of the take-home food in the beneficiary families. The consumption pattern of the take-home supplements did not appear to have altered. The elder siblings continued to share the supplements to the same extent as was seen in the earlier system where only children between 6 to 24 months age received supplements. It is, therefore, not surprising that there was no impact on the growth status of the beneficiary children. The reduction in the prevalence of Bitot spots among children who received supplements is in line with earlier observation and may be explained on the basis of the fact that the supplement provided 400 μg of vitamin A per 100 g and even after sharing, the index child would have received vitamin A in amounts sufficient to prevent ocular manifestations. These results suggested that to ensure adequate consumption of food supplements by a given child in the family, it might be necessary to treat the family as a reference unit.

TABLE–23

Mean Haemoglobin Levels of Children Studied

Age (years)	Beneficiaries Hb (g/dl)	Non–beneficiaries Hb (g/dl)
1–2	9.6 (19)*	9.9 (36)
2–3	9.9 (58)	9.9 (47)
3–4	10.7 (35)	11.7 (44)
4–5	11.7 (31)	11.6 (32)
5–6	11.4 (13)	12.2 (28)
Mean	10.5 (156)	11.0 (187)

*Figures in parantheses indicate number covered.

TABLE–24

Percent Distribution of Children According to their Haemoglobin Level

Hb. g/dl.	Baseline (1974)	1975	1976	1978	
				Beneficiary group (156)	Non–beneficiary group (187)
Less than 7	2.0	3.9	3.8	3.2	1.6
7–9	16.6	15.0	15.8	16.0	10.2
9–11	40.2	35.2	43.4	36.5	37.4
11 or more	41.2	45.9	37.0	44.3	50.8

CHAPTER 6

COLLATERAL BENEFITS OF THE FEEDING PROGRAMME

N. PRALHAD RAO and K. VIJAYARAGHAVAN

One of the major long term effects envisaged of the health and nutritional inputs provided under the Nutrition component of the Project, is a significant reduction of infant and toddler mortality with consequent acceptance of the Family Planning Programme by the community. It may, however, be expected that in addition, there could be benefits of a more immediate nature, in the form of better acceptance by the community of Maternity and Child (MCH) services being offered by the Auxiliary Nurse Midwives (ANMs).

Interim evaluation of the feeding programme in Thalak Primary Health Centre (vide chapter 3) had clearly shown that the distribution system evolved under the programme was operating with a high degree of efficiency and that the programme was found acceptable to the community. As such, one would expect that the increased contact brought about by the programme between the MCH worker on the one hand and the eligible mothers on the other would have influenced favourably the community awareness and acceptance of the health/family planning worker and her services. Also, it could be expected that the worker herself could have found the distribution programme a handy "peg to hang the hat on" and sell the family planning idea to the otherwise reluctant mother. Whether such collateral benefits from the nutrition component of the programme have accrued to the general health services available in the Project area, and if so, the nature of such benefits were assessed in this limited study. The study also aimed at identifying such of the health parameters which besides being easily collected through the existing system of routine reporting, were capable of measuring a change or changes in the health activities of the auxiliary workers in numerical terms.

Methodology :

An investigation was undertaken towards the beginning of July, 1975—nearly eleven months after the inception of the programme, in the

PHC Thalak, to study the impact of the feeding programme on two aspects: firstly on the functioning of auxiliary workers, and secondly on attitudes of the people towards the auxiliaries and their services.

For assessing the impact of the programme on the auxiliaries and the general MCH services offered by them, it was considered necessary to interview not only the workers who delivered the services but also the villagers, especially the mothers, who were the beneficiaries of such services. For this purpose, a sample of six auxiliary workers and 247 respondents, who included both beneficiaries and non-beneficiaries, were chosen from 11 randomly selected villages for interviews. Out of these, 193 respondents were from nine villages of Thalak PHC, while 54 were from 2 villages of Parasurampura. The villages were drawn from both the 'project area' (Thalak PHC) where the food distribution programme was in progress and the adjacent 'non-project' area (Parasurampura PHC) where the distribution programme had yet to be started so that it could serve as control. The control area was identical with respect to geography, socio-economic characteristics, worker-population ratio (one ANM for 4,000-5,000 population), etc. Also, the ANM of non-project area was expected to make regular weekly visits to the villages in her jurisdiction as in the case of project area.

The information was collected by administering a set of appropriate questionnaires, specially designed for the purpose. The interviews were conducted at the homes of the respondents. In addition, the data pertaining to MCH and family planning (FP) work such as the number of antenatal cases registered, deliveries conducted, primary vaccinations performed, tubectomy cases registered/operated etc., recorded routinely and maintained by the ANMs at subcentre levels, was collected (from the project area only) for a comparable period before and after the start of food distribution programme with a view to compare not only the relative performance of the auxiliaries during the two periods but also to see to what extent the recorded performance of ANMs matched with the impressions gained and expressed by them during interviews.

Results :

All the six paramedical workers interviewed had stated that the main objective of the programme was to improve the health and nutritional status of mothers and children, while four of them mentioned that the programme also aimed at inducing mothers to accept family planning programme. However, none of the six was able to state the basic hypothesis (of child survival and its relationship with the acceptance of family planning) which formed an important basis of Nutrition component of the programme.

Impact of the food distribution programme on :

MCH services : All the workers in the project area who had the benefit of working prior to the distribution programme in the area, stated that as a result of the feeding programme, more pregnant women voluntarily offered themselves for antenatal registration and examination by them. They also stated that the calls for attending to deliveries from the villagers had 'considerably' increased during that year, as compared to previous years and more women sought their advice during pregnancy and lactation.

Also, three out of six workers stated that the people in general, and women in particular, were more amenable to their advice on immunization and as a result, they were able to vaccinate neonates during routine postnatal visits without much difficulty or opposition, and also that the number of dropouts for subsequent injections of DPT vaccinations were less.

Family planning services : Out of the six workers, three stated that the programme had helped them in convincing mothers to undergo FP operations; one worker categorically denied any such benefit, while another was equivocal on this point. Information available from two of the subcentres visited, indicated (Table 25) the trend of events occurring in the area since the start of the project.

Impact of the programme on the community : Results of the analysis of interview data obtained on 247 respondents from the 'project' and 'nonproject' areas (Table 26) revealed that though almost all the respondents were aware of the ANM in both the areas, the awareness of the existence of the subcentre differed considerably in the two areas. In the project area 95 percent of the respondents knew the existence of the subcentre while only 57 percent knew about it in the non–project area. Excepting a few, living in the subcentre headquarters village, none of the persons interviewed associated the subcentre with provision of medical care. However, almost all invariably associated the subcentre with the distribution of food in the project area.

In the project area, nearly 75 per cent claimed the services of ANM as being 'useful' to them and to the community while in the non-project area, only 28 per cent stated so. The proportion of respondents in non-project area who considered the services of ANM as 'not useful' was found to be four-fold as compared to the project area.

Image of the ANM in the project and non - project areas : In the project area, the ANM was considered as a person paying more regular weekly visits (expected of her), providing better MCH services, performing

TABLE–25

MCH and FP work done by ANMs (at two subcentres) Before and After the Start of the Food Distribution Programme

1. SUB–CENTRE–NERLAGUNTE	BEFORE IPP	AFTER IPP
No. of Ante–natal cases registered	147 in 12 months	196 in 10 months
No. of deliveries conducted	7 in 12 months	38 in 11 months
No. of primary vaccinations	N. A.	N. A.
2. SUB–CENTRE–THALAK		
No. of Ante-natal cases registered	251 in 11 months	249 in 10 months
No. of deliveries conducted	37 in 11 months	39 in 10 months
No. of primary vaccinations	17 in 11 months	23 in 10 months
NO. OF TUBECTOMY CASES:		
Registered	36 in 11 months	40 in 10 months
Operated	9 in 11 months	13 in 10 months

TABLE–26

Community Awareness of Auxiliary Nurse Midwife and her services in the Project and Non–project area

	Project Area	Non–project area
No. of persons interviewed	193	54
No. of villages surveyed	9	2
NO. AND PERCENT OF PEOPLE:		
Aware of Auxiliary Nurse Midwife	193 (100.0)	54 (100.0)
Aware of sub–centre	184 (95.3)	31 (57.4)
Utilise services of Primary Health Centre	31 (16.1)	... (0)
Utilise services of Tq. Hospital	96 (49.7)	37 (68.5)
Utilise services of other dispensaries	31 (16.1)	... (0)
NO. AND PERCENT OF PEOPLE WHO STATED THAT THE AUXILIARY NURSE MIDWIFE VISITS:		
Weekly	152 (78.8)	26 (48.1)
Fortnightly	16 (8.3)	14 (25.9)
More than fortnightly	7 (3.6)	6 (11.1)
NO. AND PERCENT OF PEOPLE WHO STATED THAT THE AUXILIARY NURSE MIDWIFE VISITS:		
For MCH purpose, viz. (prenatal, postnatal care and delivery)	153 (79.3)	33 (61.1)
For vaccination purpose	34 (17.6)	5 (9.3)
For distributing medicines	95 (49.2)	19 (35.2)
For distributing food packets	80 (41.5)	... (0)
For advising Family Planning methods	20 (10.4)	22 (40.7)
NO. AND PERCENT OF PEOPLE WHO STATED THAT HER SERVICES ARE:		
Useful	144 (74.6)	15 (27.8)
Not useful	14 (7.3)	14 (25.9)
NO. AND PERCENT OF PEOPLE WHO WERE INDIFFERENT TOWARDS HER VISITS:	29 (15.0)	21 (38.9)

Figures in the parentheses indicate percentage.

more vaccinations and enquiring more about the welfare of pregnant and nursing mothers and children rathe rthan offering advice on family planning. In the non–project area, she was considered as one concerned with family planning activity and often called as 'operation sister'.

Conclusions and Recommendations:

The results of the survey appeared to indicate that the supplementary feeding programme, when operated as an integral part of general health and MCH services, will not only have the advantage of operational feasibility but will also have a beneficial impact on the overall health services of the community.

The auxiliary nurse midwife (ANM) who bears the main brunt of implementation of MCH and family planning programme at home level seemed to benefit considerably from such integrated feeding programmes. Though the perusal of available sub-centre records maintained by the ANMs did not bear out convincingly the benefits of the feeding programme on MCH and family planning services in quantitative terms, it did point, to a qualitative impact of the programme on some of the selected MCH activities. The ANMs made several specific statements during interviews. Their statements that the programme had helped " in the detection of more pregnant women from the community", "in the performance of more neonatal vaccinations", "in inducing more mothers towards acceptance of family planning operations" may be considered as indicating the non-nutritional benefits of the feeding programme on MCH services.

Association of ANM with MCH related activities such as, care of pregnant and nursing mothers, care of infants and children, vaccination, nutrition advice and health education, by the people in project area in contrast to respondents from non-project area, who identified the ANM with family planning programme and tubectomy operations, speaks of two different images of the ANM in the same community. The image of the ANM as a family planning worker in the non project area might have been due to the target oriented nature of the programme rather than a deliberate neglect of MCH work on her part. It is important here to realise that the ANM who was considered to be a better family planning worker, because she was able to get more cases for Family Planning operation, was doing a better family planning job at the expense of her other routine MCH and nutrition duties. Though impressive in the early stages, this image may in the long run be counter productive.

The better image of the ANM in the project area, as evidenced by the greater proportion of respondents considering her services as "useful', which to a great extent was attributable to the feeding programme, may

be considered as a definite positive impact of the programme of great practical significance. In the context of achieving a sustained progress in the field of family planning, acceptability of the worker by the community is of crucial importance. Success or otherwise of the Family Planning Programme is dependent, among many other things, on the ability of the worker to convince the potential mothers to accept Family Planning methods as well as on the confidence of the people in the worker. This could possibly be achieved by fostering better relations between the health workers and eligible mothers. The feeding programme seemed to have afforded increased opportunities to workers to talk to mothers about problems associated with maternal and child health and thus help to develop a better worker–mother relationship. It is, therefore, suggested that the development of this seemingly intangible but important situation in the area of operation could be made use of by the Motivation Team of Family Planning component of the India Population Project for achieving tangible results in family planning. How this could be done and what strategy should be adopted for the purpose is, perhaps, the field for Family Planning eduction experts to work on.

Secondly, from the point of measuring the impact of the programme on general health services, including Family planning, it is recommended that the project authority should develop a simple system of reporting for peripheral workers. The method, among other things should take into account the collection and maintenance of statistics on aspects like, (i) number of antenatal cases registered, (ii) number of deliveries conducted (both by ANM and Local *Dai*), (iii) number of total and neonatal vaccinations and other immunizations performed and (iv) number of family planning operations performed during each month by sub-centre functionary. Such data may be found useful in evaluating the impact of the feeding programme, in operation under the project, not only on the Family Planning but also on general health services at a later date.

Such data may be expected to provide a sound basis for monitoring the effect of the nutrition component on certain specific numerically measurable aspects of general health activity.

It is also recommended that the survey team of India Population Project could undertake a similar survey on a wider scale in the project and non-project areas and evaluate the results. The technical assistance for analysing and interpreting the data may be had from the Institute.

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CHAPTER 7

EVALUATION OF NUTRITION EDUCATION ACTIVITIES

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It is a common knowledge that the widespread undernutrition as it exists in countries like India is due to a gamut of factors such as low income, low education levels, too many births too closely spaced, low parental attention etc. Our eftorts to control this must be along a multiple front – health and nutrition improvement, educational stimulation and environmental stimulation. In India, though poverty is one of the main causes of malnutrition, it is well known that in the low income group families, there is very little recognition of the special needs of the children especially at the time of weaning and rarely does the child's diet receive special attention. Nutrition education, therefore, deserves thoughtful consideration as an important element of overall nutrition strategy. Under the India Population Project, nutrition educational activities were considered important part of nutrition component to achieve the objectives of the project. The nutrition education activities were, therefore, simultaneously started in two Primary Health Centres (PHCs) in the district of Chitradurga, where the supplementary feeding was in operation. These activities were later extended to the districts of Bangalore, Kolar, Shimoga and Tumkur.

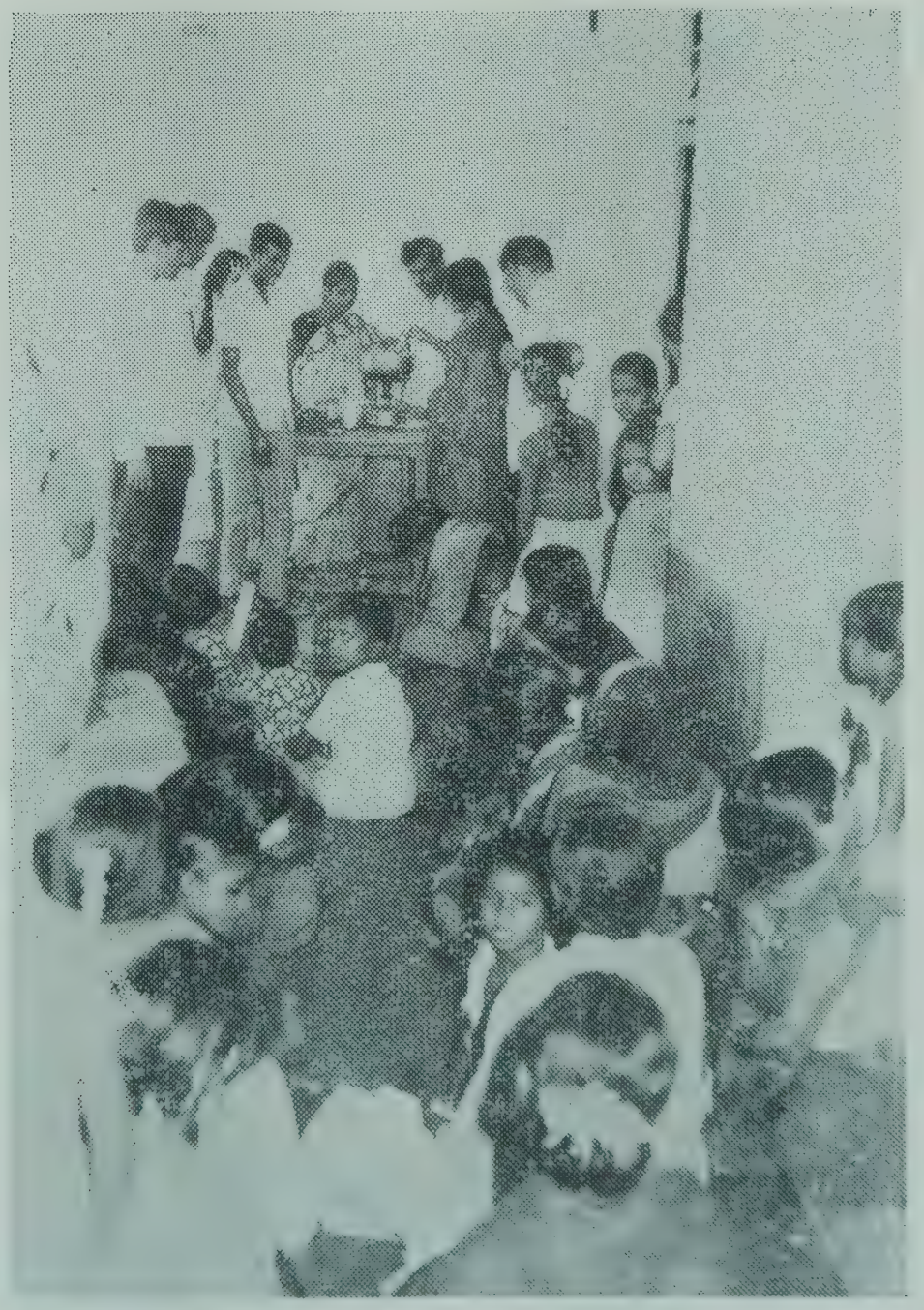
Nutrition Education Activities:

The objectives of the education activities were two fold: (1) to educate mothers about the importance of supplementary food to women during pregnancy and lactation, and to childern during infancy and early childhood, (2) to bring about a favourable change or changes in the feeding habits of infants and post-weaned children, which otherwise are faulty due to beliefs and superstitions.

The education campaign was carried out by a separate team consisting of Assistant Nutrition Officer (ANO), Deputy Health Education Officer, Health Supervisor, Lady Health Visitor (LHV) and a Projectionist. The team had separate vehicle with necessary facilities to carry the equipment required for organizing film shows and exhibitions. The main activities

Cooking demonstration sessions

Preparation of *Roti* with Energy Food



Community participation

of the team were (1) organizing "Mothers Clubs" in the villages and educating them on various aspects of health and nutrition; (2) organizing home level preparation demonstrations of recipes based on locally available inexpensive nutritious foods; (3) conducting Mobile Nutrition Exhibitions and (4) screening of films on nutrition, health and family welfare.

Content of education programme :

The main aspects covered are (1) Importance of supplementary food to women during pregnancy and lactation, and to children during infancy and early childhood; (2) early introduction of some solid food to infants around age 6 months while on breast and encouraging prolonged breast-feeding simultaneously; (3) demonstration of preparation of supplementary foods using locally available inexpensive foods to prevent PEM, vitamin A deficiency and nutritional anaemia; (4) importance of family planning methods; (5) immunization; (6) safe drinking water and personal hygiene including environmental sanitation.

Methods of education used :

In addition to group talks and cooking demonstrations, the team made use of pamphlets, flash cards, slides, films, posters and exhibits to deliver various messages. The team generally followed the guidelines issued by the Directorate with regard to methods, content and programme. The various aides used were prepared in Kannada, the language spoken in the districts covered under the programme.

The Present Study :

At the request of the India Population Project, an evaluation of the nutrition education activities carried out under its aegis in Karnataka, was undertaken with the following specific objectives :

(1) To evaluate the methodology, content and coverage of nutrition education activities in the districts of Tumkur, Kolar and Chitradurga; and

(2) to assess the impact of these activities on the community in Chitradurga district.

Area and Sample :

Only in the Primary Health Centres of Thalak and Parasurampura, in the district of Chitradurga, the education activities were in operation for more than 5 years, while in the other four districts of Tumkur, Kolar, Bangalore and Shimoga these activities were initiated about an year

back. Hence, the assessement of the impact on the community was limited to the district of Chitradurga. However, for the purpose of operational evaluation, in addition to Chitradurga, Tumkur and Kolar were selected randomly.

Area Selection :

Operational evaluation was carried out by administering a questionnaire, specially developed for the purpose, to all the functionaries actually involved in the educational activities. As far as possible, some of the health workers of PHC like Health Visitors and Auxiliary Nurse Midwives (ANMs) were interviewed. These interviews were carried out by the Officers of National Institute of Nutrition, Hyderabad. The officers also observed the educational activities actually in progress.

Impact evalution :

For the purpose of community study, all villages in the two PHCs of Thalak and Parasurampura of Chitradurga district were Categorised into Experimental and Control groups. The experimental villages were those where either group talks or cooking demonstrations were conducted six or more times since the initiation of the education activities. The control gruoup consisted of villages where either group talks or cooking demonstrations were conducted for not more than two times since inception of these activities. It was also ensured that in these villages, these educational activities had not been carried out during the previous one year. In each village all the houses were serial numbered as in census enumeration and every tenth household with a pre-school child was selected for interview. The questionnaires were administered by trained investigators under the immediate supervision of NIN Officers. The respondents were, usually, the mothers.

A total of 332 households were covered from 18 of the 19 villages selected. One village could not be covered due to inaccessibility. Table 27 gives the details of coverage.

Analysis :

Participation of child/mother in IPP as a beneficiary resulting in increased contacts with the health personnel can be expected to lead to improvement in knowledge. Hence, the respondents were classified into two main groups; (1) those who were beneficiaries under the IPP and (2) those who were not beneficiaries under the IPP. Each of these two groups was again divided into the following sub-groups: (a) Those who had actually participated in the education programmes, and (b) those who had not participated.

Health talks to mothers by Health Educator

Nutrition Exhibition – Health education by Health Visitor

TABLE–27

SAMPLE SURVEYED

	Serial No.	Village	Education Group	No. of households
E	1.	M. S. Halli		
X	2.	Jajuru	Group I	65
P	3.	Sanekere		
E				
R	4.	Dodderi		
I	5.	Nannevala	Group II	47
M	6.	Abbenahalli		
E				
N	7.	Kurudihalli		
T	8.	Nerlagunte	Group III	55
A	9.	Hirehalli		
L				
	10.	Mannekote		
	11.	B. G. Halli	Group IV	98
	12.	Ramajogihalli		
C	13.	O. B. Halli		
O	14.	Mugoobaina Hatti		
N	15.	T. B. Halli	Group V	67
T	16.	K. M. Kunte		
R	17.	Mallurhalli		
O	18.	V. V. Pura		
L				
		TOTAL		332

Thus, the respondents were classified into the following groups:

Experimental :

Group I :- IPP beneficiaries who had participated in education programme.

Group II :- IPP beneficiaries who had not participated in education programme.

Group III :- Non-beneficiaries of IPP who had participated in education programme.

Group IV :- Non-beneficiaries of IPP who had not participated in the education programme.

Control :

Group V :- The respondents of the control villages.

For the purpose of analysis, the following aspects included in the education programme were considered :

(1) Increased food requirements for women during pregnancy and lactation.

(2) Introduction of supplementary food to children from 6 months of age onwards.

(3) Food intake in children during illness.

(4) Immunization programme.

(5) Prophylaxis programmes against Vitamin A deficiency and nutritional anaemias.

(6) Knowledge about the recipes demonstrated.

(7) Need for safe drinking water.

Results :

A total of 332 households were surveyed, of which 265 were in the experimental villages while the rest were from control villages. Their distribution according to different groups is presented in table 27.

About 75% respondents in groups I, III and V felt that requirements of food during pregnancy and lactation were different as compared to non-pregnant and non-lactating women. In groups II and IV, this was stated by 62% and 54% of the respondents respectively (Table 28). However, the percentage of women specifically mentioning that more food should be

TABLE–28

Knowledge Regarding Food Requirements of Women During Pregnancy and Lactation

Topic	Group I	Group II	Group III	Group IV	Group V
Food requirements during pregnancy and lactation are different from NPNL**	75.4*	61.7	74.5	54.0	70.5
More food should be consumed during pregnancy	21.5	6.3	27.2	9.1	2.9
Lactating mothers should eat more	87.7	80.8	87.2	82.6	85.2

* Percentage of respondents

**Non–Pregnant Non–Lactating women

consumed during pregnancy was about 22 and 27 respectively in groups I and III. This was much less in the groups who had not participated in the education programme. In other words, the respondents who had attended the education sessions, irrespective of their being IPP beneficiaries or not, seemed to appreciate the fact that food requirements of women during pregnancy are more. As regards lactating women, more than 80% of the respondents in all the 5 groups mentioned that the nursing women should eat more food, indicating no differences between the groups.

Prolonged breast-feeding was a rule in the community. In general, majority of Indian mothers firmly believe that breast milk alone is sufficient until the child is able to pick and eat by himself which usually occurs beyond the age of one year. In the present study, about 23-29% of the respondents in groups I, III and V stated that breast milk alone was sufficient to children upto six months of age, as against 19% or less in the other groups (Table 29). The rest felt that breast milk alone was sufficient for longer periods. Though the differences are small, these may be considered as positive trends.

While in group IV, about 70% of the respondents appeared to have realised the necessity of providing supplements to children by 6-9 months of age, this was found to be so in more than 90% in the other groups. This could perhaps be attributed either to IPP or the education programme.

In groups I and V, about 40% of the respondents stated that semi-solids can be supplemented to infants by 6 months of age as against about 20% in groups III and IV. It was of interest to note that only 7% of the respondents in group II stated this. However, about 15% of the respondents in groups I and II and about 20% in group V stated that they have started supplements to their children by 6 months of age. In groups III and IV, this was stated by 11% and 7% respectively. These figures indicate that the actural practice of introducing supplements at an earlier age was more evident among IPP beneficiaries, though this was observed in a small proportion of respondents. The results showed that, in general, inspite of increased knowledge, practice is seen only in a small percentage in all the groups. More than 80% in group II, IV and V considered that green leafy vegetables can be given to young children as against more than 90% in groups I and III.

More than 50% of the respondents in groups I, III and IV have mentioned insufficiency of breast milk as the main reason for the starting of supplements. However, among the respondents of group IV, this was observed to be 25% as against about 40% in group II. This indicates

TABLE–29

Knowledge and Practice Regarding Infant Weaning

Topic	Group I	Group II	Group III	Group IV	Group V
Breast–milk alone is sufficient upto 6 months of age	23.1*	19.1	27.1	17.3	29.3
Necessity of providing of supplements by 6–9 months of age	96.9	93.6	89.1	77.5	97.0
Semisolids can be given to children by 6 months of age	39.9	6.9	21.8	18.3	44.0
Greenleafy vegetables can be given to young children	92.3	82.9	94.5	81.6	82.3
Actual introduction of supplements by 6 months of age	16.8	14.8	10.8	7.0	21.9
Introduction of supplements due to insufficient breast–milk	53.4	42.6	65.5	25.5	52.2

* Percentage of respondents.

that both the IPP beneficiaries and participants in the education sessions had better realization of the need for supplements, since breast milk alone is not enough to children.

In the cooking demonstration, recipes based on inexpensive, locally available foods such as cereals, pulses, groundnuts, green leafy vegetables and jaggery were cooked and shown to the community. In the present study, attempts were made to find out actually as to what percentage of respondents could correctly recall the major ingredients (cereal+pulse+ others) of the recipes demonstrated. The results (Table 30) indicated that more than 55% in groups I and III had correctly recalled the major ingredients (cereals+pulses and others) of the recipes demonstrated. This was negligible in groups II (4%) and IV (1%), while in group V, about 24% correctly stated the major ingredients. It was heartening to note that more than 80% of the respondents in groups I and III stated that the recipes demonstrated could be given to children of six months of age. Though about 47% in group V stated this, in groups II and IV, this was about 20% or less indicating the impact on the women participating in the education sessions. It was also observed that while 65% of the respondents in group I had actually prepared such a recipe at home, in groups III and V, only about 25% of the respondents reported to have prepared the recipe and in groups II and IV this percentage was considerably small (12 and 5% respectively). Similar trends were noticed with regard to the feeling that the recipe was beneficial. While about 50% of the respondents in group I stated that the recipe had actually improved health/growth of their children, only 2% in group IV and 10–15% in groups II, III and V said so. These results indicated the synergistic effect of education activities delivered simultaneously in any supplementary feeding programme. Poverty was stated to be the main reason for not preparing the recipe at home.

More number of respondents who had actually participated in education sessions were aware of the fact that inadequacy of food can cause diseases (Table 31). About 15–20% of the respondents in groups I, III and V stated lack of good food as main reason for kwashiorkor, whiie oṅly about 5% in groups II and IV stated so.

Only a small percentage (20–30%) of the respondents felt that the normal food can be given during fever, diarrhoea and measles. There appeared to be no differences between the different groups.

In general, more than 75% of the respondents were aware of the immunization programmes, with the lowest percentage in the group IV (Table 32). The percentage of respondents stating that some childhood diseases could be prevented by immunization was higher in groups I (74%) and III (80%) as against 50% in the rest of the groups. It was

TABLE–30

Knowledge and Practice Regarding Recipe Demonstrated

Topic	Group I	Group II	Group III	Group IV	Group V
Could recall correctly major ingredients of recipe demonstrated	55.3*	4.3	59.9	1.0	23.6
Recipe can be given to children of 6 months of age	84.6	21.2	79.9	13.2	47.0
Prepared the recipe at home	60.0	12.7	25.4	5.1	32.3
Recipe beneficial to children	83.1	12.7	47.2	4.0	33.8
Recipe improved health/growth of children	48.6	10.0	18.1	2.0	16.4

* Percentage of respondents.

TABLE–31

Knowledge About Diet and Disease

Topic	Group I	Group II	Group III	Group IV	Group V
Inadequacy of food can cause disease	55.4*	36.1	74.1	36.7	47.0
Lack of food causes kwashiorkor	20.0	6.4	16.4	5.1	13.4
Normal food can be given to children with diarrhoea	16.9	21.2	18.1	23.5	27.9
Normal food can be given to children with measles	25.4	38.2	32.7	31.6	47.0
Normal food can be given to children with fever	12.3	12.7	19.9	14.2	26.4

* Percentage of Respondents.

TABLE–32

Knowledge and Practice About Immunization Programmes

Topic	Group I	Group II	Group III	Group IV	Group V
Aware of immunization programmes	92.3*	87.2	92.7	75.5	89.7
Childhood diseases could be prevented by immunization	73.9	48.9	79.9	53.0	54.4
Her child was immunized	96.9	97.8	92.7	81.6	91.1
Aware of DPT/Polio immunization to her child	47.7	25.5	51.0	14.3	11.5
Immunization was beneficial	93.9	76.5	89.1	68.3	76.4

* Percentage of respondents

heartening to note that more than 90% of the respondents in all the groups excepting group IV (82%) reported to have got their children immunized. Almost all the respondents were aware of small-pox vaccination to their children. However, only about half of the respondents in group I and III were aware of the D.P.T. or anti-polio immunization. This percentage was considerably less in other groups, being lowest in the group IV. In general, more than 3/4 of the respondents felt that the immunization was beneficial to their children.

About 70% of the respondents in groups I and III stated that they were aware of the vitamin A prophylaxis programme, had got vitamin A administered to their children and considered that this was beneficial. In the other groups, however, awarness was reported by less than 50% of the respondents. Similar trends were observed with respect to distribution of iron and folic acid tablets for the prevention of nutritional anaemias (Table 33).

The percentage of respondents knowing that impure water leads to gastro-intestinal symptoms such as diarrhoea, vomiting, etc., was about 20% in groups I and III as compared to about 10% in the rest of the groups. Though the percentage was small, these figures should be viewed taking into consideration the general feeling in the community that impure water causes colds and fever.

Operational Evaluation :

A total of 28 personnel involved in the education activities (Table 34) were interviewed to assess operational aspects of the programme. The categories interviewed were (1) Assistant Nutrition Officer (ANO), responsible for overall supervision and organization of educational activities, (2) Deputy Health Education Officer, mainly responsible for organizing mothers' clubs and delivering health talks, (3) Health Supervisor, responsible for arranging mobile nutrition exhibitions and (4) Lady Health Visitor (LHV), responsible for arranging cooking demonstrations. In addition, Area-Lady Health Visitor and ANMs, who assisted the education team in their jurisdiction were also interviewed.

All the functionaries except ANOs mentioned that the objectives of IPP, in general, were to educate the community in health, nutrition and family welfare. The ANOs, however, stressed on the improvement of the infrastructure facilities like construction of buildings, provision of staff and training. None of the functionaries mentioned the actual objectives (as mentioned in chapter 1) of the IPP. However, all of them considered that nutrition and health education was an important means to achieve the goals of IPP.

TABLE-33

Knowledge and Practice Regarding Nutrition Programmes

Topic	Group I	Group II	Group III	Group IV	Group V
Aware of massive dose vitamin A programme	76.9*	48.9	78.1	48 9	50.0
Her child actually received vitamin A	72.3	42.5	70.9	39.7	44.1
Vitamin A Programme is beneficial	70.8	38.2	65.4	39.7	35.2
Aware of Folifer tablet distribution	73.9	63.8	74.5	53.0	67.6
Actually received Folifer tablets	63.1	57.4	65.4	41.8	42.6
Folifer distribution is beneficial	60.0	57.4	61.8	36.7	36.7

* Percentage of respondents.

TABLE–34

Details of Functionaries Interviewed, Number Covered and their Duties as Stated

	MEMBERS OF EDUCATION TEAM					PHC STAFF	
	Assistant Nutrition Officer	Deputy Health Education Officer	Health Supervisor	Lady Health Visitor	Projectionist	Lady Health Visitor	Auxiliary Nurse Midwife
Number	3	4	1	4	2	4	10
DUTIES	1. Overall supervision 2. Liaison between MO PHC and DHFWO for organizing activities. 3. Development of education aids.	1. Organization of mothers' clubs. 2. Follow-up house to house visits to educate antenatal and postnatal cases. 3. Organizing exhibitions 4. Public co-operation.	1. Organizing mobile nutrition exhibitions. 2. Organizing cooking demonstrations. 3. Organization of group talks 4. Collection & compilation of periodical returns.	1. Organization of cooking demonstrations. 2. Assist in exhbitions and group talks.	Organizing film shows.	Assist the education team during visit to PHC areas in their educational activities.	

Though each member of the education team had specific job responsiblility, in practice, however, there was considerable sharing and overlap of the tasks. The education teams drew up monthly programme for carrying out the various education activites and followed the schedule as far as possible. The programme of the team was usually approved by the District Health and Family Welfare Officer (DHFWO) and communicated to the concerned peripheral medical and para-medical personnel. However, to take care of the problems of village approchability, community cooperation and other facilities at the village level, the actual selection of village for conducting the programme was done in consultation with the concerned ANM and LHV on the spot.

Usually, the sessions were conducted in public places like *panchayat* office, school or temple. In some cases houses of local leaders were also used. All the members of the teams stated that in a session, more than one topic (message) were covered. No special attempts were made to highlight any one particular message per session. Usually, all the topics such as supplementary foods, family welfare, immunization, nutrition programmes and environmental sanition were simulteneously covered.

Wherever facilities available, group talks were conducted using slide projection. During cooking demonstrations and health talks, a few flash cards were used. To the literate group, printed material was also distributed. The mobile nutrition exhibition displayed a number of charts, posters and exhibits covering all the aspects. Usually the health supervisor conducted the people round the exhibition. In general, only one session was conducted in a village. Repeated visits were far and few (Table 35). According to the functionaries, considerable segment of the community evinced interest in the education sessions and there was active participation by a section of the audience during each session. The teams felt that the coverage by them was not adequate. However, the concerned ANM and LHV, during their regular visits, followed up the education activities with the community thus increasing the coverage, it was reported.

It was reported that cooking demonstrations and group talks were normally conducted either during morning or evening hours depending upon the suitability of the community. But some suggested that slight modification of the timings might attract more people. The film shows and exhibitions were always conducted during nights. Almost all the functionaries stated that the education activities, in their opinion, had some impact on the knowledge and practice of the community. A few members of the community mentioned that they actually prepared recipes, demonstrated for their children.

TABLE–35

Coverage of PHC and Villages for Various Nutrition Activities

Name of the District	No. of PHCs covered	Total No. of villages	Group talks		Cooking Demonstration		Exhibition		Film shows	
			%villages covered	%villages re-visited	%villages visited	%villages re-visited	%villages visited	%villages re-visited	%illages visited	%villages re-visited
*Chitradurga (July '77)	2+	155	5.2	5.2	100.0	100.0	80.0	38.7	86.0	54.8
Kolar (Jan. '79)	6	1579	8.0	1.5	23.0	2.0	6.0	0.3	8.1	0.3
Tumkur (November '78)	9	1987	9.2	0.2	16.6	2.7	4.5	1.1	5.2	1.1

* Cooking demonstration started in July, 1974

+ Two more PHCs were included later.

It was unanimously felt that one team of health workers per district will not be able to effectively carry out the education activities in large number of villages of the district. Most of the problems mentioned by the members of the teams pertained to administration and none mentioned any problems concerning the methodology and content of the education programmes. The problems mentioned were lack of cooperation from the District Health set up, frequent withdrawal of vehicle meant for the team for other purposes, posts being vacant and vastness of the area to be covered.

Some of the important suggestions were: (i) Increasing the number of teams in each district; (ii) Training of all the members; (3) Active involvement of PHC staff, (4) Administrative independency of the unit, (5) Increased allocation for POL and (6) Supply of more effective audiovisual aids.

Discussion :

The need for education campaign is universally recognised and stressed in several evaluation studies of nutrition programmes. However, no concerted efforts have been made in that direction in any part of the country. The present education efforts under the IPP can be considered as unique in the sense that systematic educational campaign has been attempted in a large scale with a unit at the district level.

When the overall picture is considered, it can be stated that educational sessions have had some positive impact on the knowledge about certain nutritional and health aspects of the community (Table 36). The results point out to the fact that the community in general, is already aware of the need for increased food requirements for women during lactation, and education has had no impact on this. However, in case of pregnancy, there seemed to be some reservations in the community about giving additional food. The results of the present study reveal that such attitudes can be changed for better only with concerted educational efforts. The participation in education sessions obviously convinced a number of women about the need for more food during pregnancy.

Most important topic supposed to have been stressed during the education activities, as per the guidelines, was introduction of semisolid and solid foods, based on cereal-pulse combination, along with breast feeding to children from 6 months of age. The results of the present study indicated that the knowledge about introduction of semi-solids by six months of age, starting of supplements realising the insufficiency of breast milk by that age etc., in the groups that had participated in the education sessions was better, though not very strikingly (Table-36). The percentage

TABLE–36

Knowledge and Practice Regarding some Aspects of Health and Nutrition in Participants and Non-Participants of Education Activities

SUBJECT	TOPIC	Group I** (120)	Group II (145)
PREGNANCY & LACTATION	Food requirements to women during pregnancy and lactation are different from NPNL	*75.0	56.5
	More food should be consumed by women during pregnancy	24.0	8.2
INFANT AND CHILD FEEDING	Semisolids can be given to children by 6 months of age	31.6	14.6
	Actual introduction of supplements by 6 months of age	14.1	9.5
	Introduction of supplements due to insufficient breast-milk	58.9	31.0
COOKING DEMONSTRATION OF RECIPES	Could recall correctly major ingredients of recipe demonstrated	57.4	2.1
	Prepared the recipe at home	44.1	7.6
	Recipe improved health/growth of children	34.6	4.6

* Percentage of respondents. Figures in parentheses are number covered.

**Group I Participants in education session
Group II Non-participants in education session

Contd. on Page 71

TABLE–36 (Contd.)

SUBJECT	TOPIC	Group I	Group II
DIET AND DISEASE	Lack of food causes kwashiorkor	18.4	5.5
IMMUNIZATION	Childhood diseases could be prevented by immunization	76.7	51.7
	Aware of DPT/Polio immunization to her child	49.2	17.9
PROPHYLAXIS AGAINST VITAMIN–A	Aware of Massive Dose Vitamin A Programme	77.5	48.9
DEFICIENCY AND NUTRITIONAL	Her child actually received Vitamin A	71.7	40.6
ANEMIAS	Aware of Folifer tablet distribution	74.2	56.5
	Received Folifer tablets	64.2	46.9

of participants in education sessions who had actually started supplements (actual practice) to their children was small, though higher than in the group that had not received education. It appeared that while there was a change in the knowledge as a result of nutrition education, when it came to actual practice, only a small percentage of respondents actually adopted the advice. Similar observations have been reported in earlier studies where though the community had gained knowledge from education programmes, the proportion of women practising the suggestions/advice was small. Poverty has been considered as one of the important reasons for this. In the present study also, a majority of the respondents did mention lack of resources as one of the reasons for not practising the advice. However, the respondents from IPP areas, participating in the education programmes, had, in fact, practised the advice more than the other groups. This could be attributable to the fact that in the project, nutrition education was accompanied with free food distribution. This suggests the need for education campaign as part of supplementary feeding programmes, which not only ensures the success of the feeding programme, but also helps the community to actually learn and practise good nutrition.

One of the observations that needs to be highlighted is that a large proportion of respondents were able to recall the ingredients of the recipe demonstrated. They were convinced about the suitability of the recipe to children of 6 months of age and fed the recipe prepared at home. They felt that after receiving the supplement, their children were healthier. The results indicated that actual demonstrations rather than mere health talks have better impact on the participants and therefore of better educational value.

The knowledge regarding the need for giving normal food during illnesses like diarrhoea, measles and fever was not different in the two groups. The community, in general, firmly believes that diet should be restricted during such illness. This practice, in fact, aggravates the situation in the already marginally malnourished children. It has been observed in the study that the percentage of respondents with correct knowledge even among the participants in education sessions was generally low regarding: (a) the need for increased food requirements during pregnancy, (b) breastmilk alone is not sufficient beyond the age of 6 months, (c) lack of food as cause for kwashiorkor/marasmus and (d) drinking water as a cause of gastro-intestinal infections. The reasons for low levels of knowledge may be that these aspects were, perhaps, not sufficiently emphasised during education sessions to fully convince the community. In other words, there is need to lay special emphasis on these

aspects during the education sessions. Also, the members of the education team were, perhaps, not properly oriented to put across these important health and nutrition aspects. This can be improved by imparting proper orientation and training to all the team members.

In general, the respondents in the control villages, where education activities were not conducted at least for the last one year, appeared to be better than the group which did not participate in education activities. However, the groug participating in education sessions was found to be better than the control group thus indicating the influence of continuing education.

The rural community in India is generally tradition bound and illiterate. To be effective, any education programme should cover as large a proportion of the population as possible and should be repeated at short intervals with appropriate methods In the current educational activities of IPP, the coverage was about 28% for group-talks and 43% for cooking demonstrations as stated by the respondents. This was achieved by the teams by visiting the village six times or more over a period of 5 years in the limited number of villages of the selected PHCs. This coverage by no means can be considered as adequate for an effective education campaign. Under the existing conditions, however, the team cannot cover completely the large number of villages in a district. Universal coverage is possible only by increasing the number of teams, perhaps, one for each PHC. This obviously is not practicable because of financial constraints. However, this can be achieved by strengthening the follow up visits by the PHC staff like ANMs, and LHVs. In fact, the teams and the peripheral health staff of PHC did suggest this as a practical measure for effective and universal coverage The district team can be used to train the PHC staff and initiate sessions in some selected sub-centre areas. The results indicate that some topics were not emphasised enough because of lack of visual aids, needed to be used to cover the various topics. A series of such aids like flash cards, flip charts, inter-linking the various aspects can be expected to yield better results.

In conclusion, it can be said that the education campaign under IPP has achieved the primary objective of increasing knowledge about nutrition and health in the community, though in a limited way. The performance of the unit can be improved, if additional facilities are provided.

Comment :

Some of the reasons for low achievement of the educational efforts in the project were as follows:

(1) The coverage was not adequate.

(2) One team per district cannot effectively carry out educational activities in large number of villages in a district.

(3) Lack of proper emphasis on some of the important nutrition and health aspects.

(4) Lack of proper orientation of team members to deliver the messages.

(5) Inadequacy of appropriate education materials.

(6) Certain administrative difficulties in carrying out day-to-day educational activites faced by the functionaries.

Recommendations :

Considering the above observations, the following recommendations are made for effective implementation of education programme:

1) All the members of the team should be properly oriented and trained in delivering the appropriate messages using suitable extension methods.

2) The teams in turn should be used to train the peripheral health staff of PHCs and initiate the education programme in sub-centres. The team should see that these peripheral health workers actually carry on the education programme in their respective areas. Necessary facilities should be extended to the peripheral staff.

3) In view of the effectiveness of the cooking demonstrations, these should from an integral part of the programme and be organized more frequently.

4) As far as possible, the teams should have independent role in planning and implementing the educational activities bereft of the routine administrative bottlenecks. Necessary facilities such as transport, appropriate visual aids, etc., should be provided to the team.

5) The education effort should continue and, in fact, be extended to other districts as well. This could be done in a phased manner incorporating the innovations developed from the experience gained.

CHAPTER 8

SUMMARY

India Population Project was launched by the Governament of Karnataka in 1974, in collaboration with World Bank and Swedish International Development Agency.

The Project had two components: (i) Nutrition Component and (ii) Family Planning Component. As a part of nutrition component of the project, a large scale supplementary feeding programme to pregnant and lactating women, and children between 6 and 24 months of age was operated on a take-home basis in the district of Chitradurga, to test whether there will be anyimprovement on the nutritional status of the community as a result of the feeding programme, and to determine whether such an improvement either directly or indirectly can have a favourable influence on the desire of mothers to limit family size. In addition, intensive nutrition education programme formed an integral part of supplementary feeding. The programme was initiated in one of the PHCs (Thalak) of the district on a pilot basis.

The food supplement was based on wheat-pulse-groundnut mix and provided 200 calories per child per day and 400 calories per woman per day. The various aspects of the nutrition component were evaluated by the National Institute of Nutrition between 1974 and 1980. The studies included assessment of : a) the impact of the supplementary feeding programme on nutritional status of target groups; b) distribution and fate of take-home supplement; (c) spin off benefits of feeding programme and d) nutririon education activities carried out under the project.

The results of the study showed that the distribution system organised under the programme was operated with a high degree of efficiency reaching the beneficiary group regularly without any major breakdown in the supply of supplementary food.

About 2/3 of the total beneficiaries received supplements for more than 80% of the distribution days.

Distribution of the energy food to all severe cases of PEM resulted in reduction of prevalence of both kwashiorkor and marasmus, indicating that such cases are amenable to domiciliary management and treatment.

The growth pattern, prevalence of vitamin deficiency signs and anaemia among the children did not show any improvement. So also, there was no change in the childhood mortality rates of the area.

Lack of beneficial impact was mainly due to the fact that the supplement did not completely fill the dietary deficit and there has been extensive sharing of the supplement.

In 75% of the beneficiaries, the supplement was shared by one or more children. Only a fifth or less of the beneficiary population tended to be the regular and exclusive consumers of the supplement.

An extension of the feeding programme to all the children between 6 and 60 months of age, to reduce sharing by other children which was observed during the evaluation, did not reduce sharing of the supplement to any significant effect. Children between 5 and 10 years were found to share the supplement, suggesting that family may have to be considered as unit rather than individuals.

After the initiation of the supplementary feeding programme, more mothers introduced solid supplements to their young children of about 6 months of age.

As a result of the nutrition programme, the image of the ANMs improved resulting in greater acceptance of MCH services offered by them.

The nutrition education activities resulted in improving the knowledge of the communities about health and nutrition with reference to : a) the need for more food to women during pregnancy b) preparation of low cost weaning foods at home level and their usefulness, c) the awareness of benefits of immunisation programmes and d) other nutrition intervention programmes like massive dose vitamin A distribution and iron and folic acid supplements.

One team per district to carry out nutrition education did not appear adequate to be effective.

BIBLIOGRAPHY

1. Gowda, A. N. India Population Project. *Newsletter Population Centre Bangalore.* **1**: 3, 1975.
2. Narasinga Rao, B. S., Visweswara Rao, K. and Nadamuni Naidu, A. Calorie Protein adequacy of the dietaries of Preschool children in India. *J. Nutr. Dietet.* **6**: 238, 1969.
3. Weiner, J. S. and Lourie, J. A. *Human Biology–A Guide to Field Methods.* International Biological Programme Handbook No. 9. pp. 7 – 12. Oxford: Blackwell Scientific Publications. 1969.
4. Vaidyanathan, K. E. The Panel Longitudinal approach in demographic enquiries. *Sankhya, Series B.* **36**: 314, 1974.
5. Pralhad Rao, N., Darshan Singh and Swaminathan, M.C. Nutritional Status of Preschool children of rural communities near Hyderabad city. *Ind. J. Med. Res.* **57**: 2132.
6. Devadas, R. P. Take home system Vs on-the-spot feeding. *Proc. Nutr. Soc. (India).* **15**: 68, 1973.
7. Gopaldas,T. Take home system Vs on the spot feeding. *Proc. Nutr. Soc. (India).* **15** : 57, 1973.
8. Tara Gopaldas, Kansra, A. C., Srinivasan, N., Varadarajan, I., Shingwekar, A. G , Seth, R , Mathur, R. S. and Bhargava, V. *Project Poshak.* Vol. 1, New Delhi, CARE–India, 1975.
9. Krishnakumari, V. K., Malathi Damodaran and Parvathi Rau. Evaluation of domiciliary management of Protein Calorie Malnutrition. *Trop. Geogr. Med.* 27: 99, 1976.
10. Vijayaraghvan, K., Nadamuni Naidu, A., Pralhad Rao, N. and Srikantia, S. G. A simple method to evaluate the massive dose Vitamin A Prophylaxis Programme in Preschool children. *Amer. J. Clin. Nutr.* **28**: 1189, 1975.
11. Hanumantha Rao, D., Satyanarayana, K. and Gowrinath Sastry. Growth Pattern of well to do Hyderabad Preschool children. *Ind J. Med. Res.* **64**: 629, 1976.
12. Gomez, F., Ramos, S., Frenk, S., Cravioto, J., Chavez, R. and Vangnez, J. Mortality in second and third degree malnutrition *J. Trop. paed.* **2**: 77, 1956.
13. Swaminathan, M. C., Jyothi, K.K., Ragbir Singh, Shantha Madhavan and Gopalan, C. A semi longitudinal study of growth of Indian children and the related factors. *Ind. ped.* **1**: 255, 1964.

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